# CHASSIS E9

# *SERVICE MANUAL*

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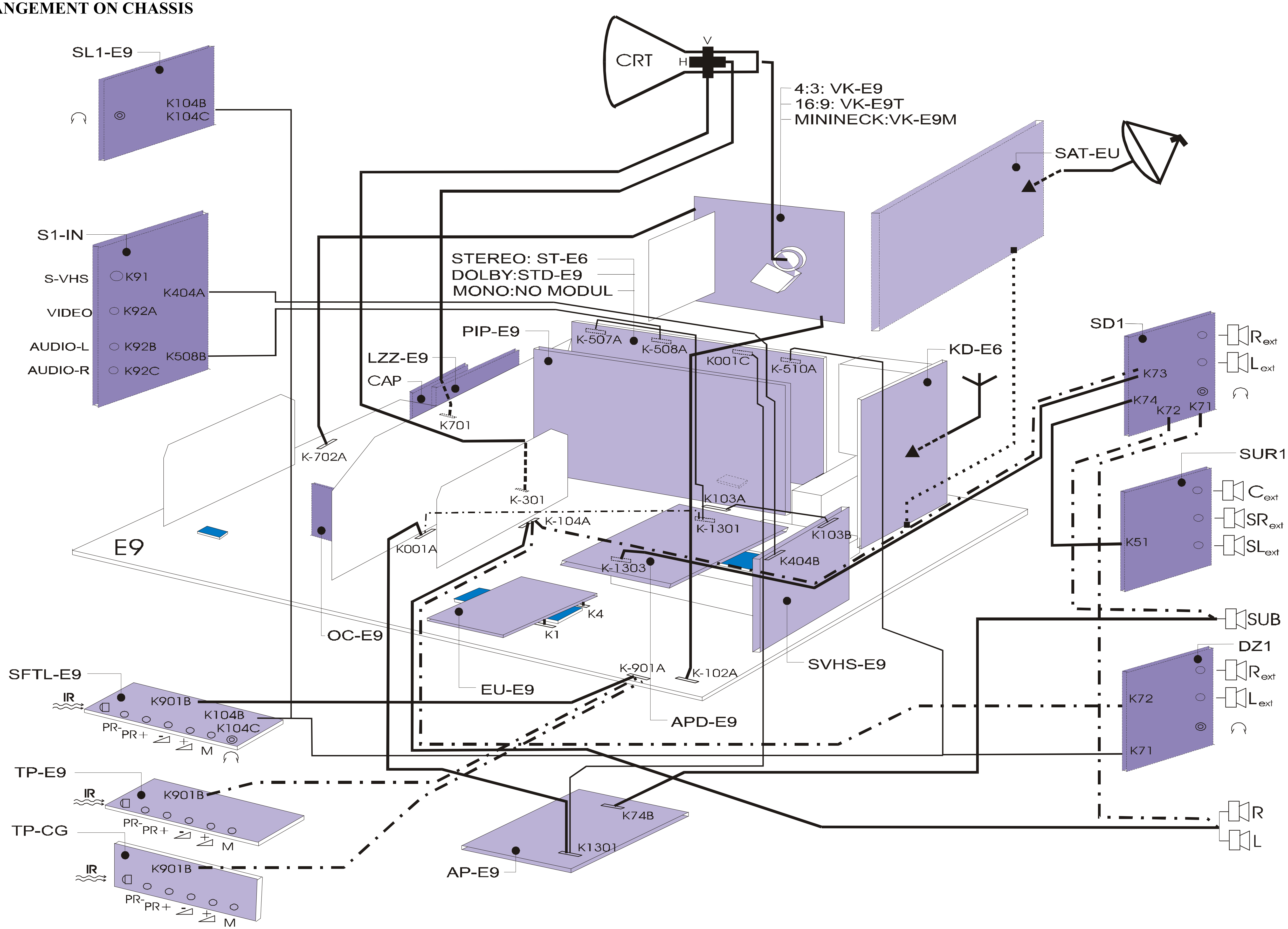
# E9 CHASSIS - TECHNICAL SPECIFICATION – Rev.11

| | TVTEXT Version 1p (SDA5252-2) | TVTEXT Version 7p (SDA 5255-2) | TVTEXT Version Dolby 7p (OTP) |
|---|---|---|---|
| ***1. SCREEN SIZE:*** | 90° or 110°,<br>14",20",21", 25", 28", 33" (4:3). | 90° or 110°,<br>21", 25", 28", 33" (4:3),<br>28", 32" (16:9). | 90° or 110°,<br>21", 25", 28", 33" (4:3),<br>28", 32" (16:9). |
| ***2. AVAILABLE STANDARDS:*** | • PAL BG,<br>• PAL I,H **(opt.)**,<br>• PAL/SECAM BG **(opt.)**,<br>• PAL/SECAM BG / DK **(opt.)**,<br>• NTSC through SCART **(opt.),**<br>• SECAM L/L' **(opt.)**. | • PAL BG,<br>• PAL I,H **(opt.)**,<br>• PAL/SECAM BG **(opt.)**,<br>• PAL/SECAM BG / DK **(opt.)**,<br>• NTSC through SCART **(opt.)**,<br>• SECAM L/L' **(opt.)**. | • PAL BG,<br>• PAL I,H **(opt.)**,<br>• PAL/SECAM BG **(opt.)**,<br>• PAL/SECAM BG / DK **(opt.)**,<br>• NTSC through SCART **(opt.),**<br>• SECAM L/L' **(opt.)**. |
| ***3. TUNER:*** | HYPERBAND: VHF 2-12, UHF 21-69, S1-S41 | HYPERBAND: VHF 2-12, UHF 21-69, S1-S41 | HYPERBAND: VHF 2-12, UHF 21-69, S1-S41 |
| ***4. FEATURES:*** | Frequency synt. (125KHz search steps),<br>MENU oriented OSD (On Screen Disp.)<br>100 programs,<br>Full function remote control,<br>Automatic switch off at the end of the progr.<br>Off timer 0 - 120 min.,<br>*Organise Program Information System (OPIS) with the following functions:*<br>• Autostore<br>• Insert<br>• Delete<br>• Rename,<br>Hotel mode (**opt.**). | Frequency synt. (125KHz search steps),<br>MENU oriented OSD (On Screen Disp.) Multilanguage MENU OSD,<br>100 programs,<br>Full function remote control,<br>Automatic switch off at the end of the progr.<br>Off timer 0 - 120 min.,<br>Organise Program Information System (OPIS) with the following functions:<br>• Autostore with simple ATS: Autostore, Name, Order,<br>• Insert<br>• Delete<br>• Rename,<br>Copy funct. SCART2 to SCART1 **(opt.)**,<br>Hotel mode **(opt)**. | Frequency synt. (125KHz search steps),<br>MENU oriented OSD (On Screen Disp.)<br>Multilanguage MENU OSD,<br>100 programs,<br>Full function remote control,<br>Automatic switch off at the end of the program<br>Off timer 0 - 120 min.,<br>Organise Program Information System (OPIS) with the following functions:<br>• Autostore with simple ATS: Autostore, Name, Order,<br>• Insert<br>• Delete<br>• Rename,<br>Copy function SCART2 to SCART1 **(opt.)**,<br>Hotel mode **(opt.)**. |
| ***5. SOUND:*** | MONO/STEREO/DUAL sound decoder,<br>Digital Stereo Sound Processor,<br>Muting,<br>1 or 2 loudspeakers (STEREO),<br>Audio music power output:<br>1x15W (MONO),<br>2x15W (STEREO),<br>STEREO through SCART **(opt.)**,<br>German STEREO + NICAM **(opt.)**, | MONO/STEREO/DUAL sound decoder,<br>Digital Stereo Sound Processor,<br>Muting,<br>1 or 2 loudspeakers,<br>Audio music power:<br>1x15W (MONO),<br>2x15W (STEREO),<br>Additional 2 tweeter loudspeakers **(opt.)**,<br>Built in additional Subwoofer loudspeaker with 30W music power **(Cabinet opt.)**,<br>STEREO through SCART **(opt.)**,<br>German STEREO + NICAM **(opt.)**,<br>Automatic volume levelling **(opt.)**, | Dolby Surround Pro-Logic sound ,<br>MONO/STEREO/DUAL sound decoder,<br>Digital Stereo Sound Processor,<br>Muting,<br>2 loudspeakers,<br>Additional 2 tweeter speakers **(opt.)**,<br>Built in additional Subwoofer loudspeaker **(Cabinet opt.)**,<br>Audio music power: 60W<br>(15W Left, 15W Right 15W Centre, 15W Surround)<br>German STEREO + NICAM **(opt.),**<br>Automatic volume levelling **(opt)**,<br>Separate volume adj. on Headphones. |

| | | | |
|---|---|---|---|
| | | Separate volume adj. on Headph.s **(opt.)**. | |
| | **TVTEXT Version 1p (SDA5252-2)** | **TVTEXT Version 7p (SDA 5255-2)** | **TVTEXT Version Dolby 7p (OTP)** |
| ***6. TELETEXT:*** | 1 - page TTX with P26, Westeuropean and easteuropean language support. | 7 - page TTX with the TOP (**opt.**), FLOF and P26, Westeuropean and easteuropean language support. | 7 - page TTX with the TOP (**opt.**), FLOF and P26, Westeuropean and easteuropean language support. |
| ***7. CONNECTIONS:*** | SCART I AV connector (21 - pin)<br>video,<br>RGB,<br>SVHS,<br>HeadPhones Socket **(opt.)**,<br>Antenna connection 75 ohms unbalanced. | SCART I AV connector (21 - pin) video, RGB and SVHS,<br>HeadPhones Socket **(opt.)**,<br>SCART II **(opt.)**,<br>MINI DIN SVHS connector with chinch AV inputs **(opt.)**, front or backside AV - cabinet dependent,<br>External speakers connectors **(opt.)**,<br>Antenna connection 75 ohms unbalanced, | SCART I AV connector (21 - pin) video, RGB and SVHS,<br>HeadPhones Socket **(opt.)**,<br>SCART II **(opt.)**,<br>External speakers connectors (Front L and R, Rear L and R<br>MINI DIN SVHS connector with AV chinch inputs **(opt.)**, front or backside AV - cabinet dependent,<br>Antenna connection 75 ohms unbalanced. |
| ***8. ADDITIONAL OPTIONS*** | 1TPIP - 1 tuner picture in picture **(opt.)**, | 1TPIP - 1 tuner picture in picture **(opt.)**,<br>2TPIP - 2 tuner picture in picture (**opt.)** with the sound on the headphones from 2nd tuner source. | 1TPIP - 1 tuner picture in picture **(opt.)**,<br>2TPIP - 2 tuner picture in picture (**opt.)** with the sound on the headphones from 2nd tuner source. |
| ***9.VIDEO:*** | Black and Blue stretch,<br>Blue back when no video,<br>Automatic Colour limiting,<br>CTI **(opt.)**,<br>ZOOM. | Black and Blue stretch,<br>Blue back when no video,<br>Automatic Colour limiting,<br>Colour Temperature adjustment,<br>CTI **(opt.)**,<br>ZOOM (4:3),<br>Linear picture zoom (16:9). | Black and Blue stretch,<br>Blue back when no video,<br>Automatic Colour limiting,<br>Colour Temperature adjustment,<br>CTI **(opt.)**,<br>ZOOM (4:3),<br>Linear picture zoom (16:9). |
| ***10. CONSUMPTION:*** | ≈65W for 90°<br>≈95W for 110°<br>*POWER REQUIREMENTS:*<br>Voltage/frequency: 230V/50Hz<br>rating (180V - 250V) | ≈65W for 90°<br>≈95W for 110°<br>*POWER REQUIREMENTS:*<br>Voltage/frequency: 230V/50Hz<br>rating (180V - 250V) | ≈65W for 90°<br>≈95W for 110°<br>*POWER REQUIREMENTS:*<br>Voltage/frequency: 230V/50Hz<br>Rating (180V - 250V) |

24.12.1999

**MODULES ARRANGEMENT ON CHASSIS**




12.12.1999

# GENERAL INSTRUCTIONS

**X-RAY RADIATION**

Picture tube is potential source of X-radiation of colour TV. Use exclusively original types of replacement picture tubes, specified in technical documentation. Accelerating high voltage must not exceed 30 kV. Supply voltage "B+" for horizontal output stage must be set according to the specifications given in service manual.

**SAFETY INSTRUCTIONS**

Service interventions on colour TV can be performed by authorised and qualified personnel only, considering the following instructions:

- During service interventions connect the TV set to mains voltage through separating (isolating) transformer.
- During servicing procedures (replacement of individual components) disconnect the cord from mains connector.
- After disconnection and before servicing wait about 30 sec. so that charged electrolytes and picture tube are discharged.
- Provide for additional discharge of picture tube when replacing it and use protective means to prevent injuries due to eventually broken glass.
- When changing modules or complete chassis, fix it with adequate elements (screws, latches, ...).
- Wires inside the TV set should not come in contact with sharp or hot areas.
- Integrated circuits and other semiconductors on chassis are sensitive to overvoltages and high temperatures.

During service interventions they should be protected against too long heating with soldering iron (5 sec.), electrostatic discharges, short circuits between connectors etc. Therefore the following general instructions should be followed:

- Use low impedance disconnecting transformer for connection of chassis to mains voltage.
- Use low voltage soldering irons with protective earthing.
- Chassis earthing should be equal to earthing of measuring and calibrating equipment and tools.
- When connecting instruments, first connect negative connector (mass, earth) and afterwards signal connector.
- Voltages to be checked should be measured with suitable instruments. Do not use "short-circuit methods" with pincets or screwdriver.
- Conductors under high voltage should not be placed near semiconductors on chassis.
- Installed IC's, transistors and MOSFET's are made in various semiconductor technologies (CMOS, MOS, BIMOS or bipolar technology) and are more or less sensitive to exterior effects during handling. All these elements should be handled in accordance with the requirements for electrostatic protection. If these requirements are fulfilled, you prevent formation of undesired electrostatic discharges which can destruct semiconductors or can activate destructive mechanisms, which destroy circuit during operation.

Accumulated electrostatic charge is discharged through individual connectors of IC or transistor during electrostatic discharges and current runs through semiconductor structure. Considering that thicknesses of semiconductor substrate, used for IC, are very small, this current can cause damages to IC or destroy it. For the protection of circuits the currents originating from discharges should be discharged under control. This is obtained in the following ways:

- Staff handling the ICs should have earthed hands by means of a suitable wire and resistor.
- Working table should as well be earthed. Working surface should be made of conducting material (conducting rubber), soldering irons and all required equipment should be earthed.
- Carrying and storing is permissible only in original packaging (antistatic tubes, conducting sponges).
- If IC is mounted on a base, it should not be replaced under voltage.

**MEASUREMENT CONDITIONS**

- HF input signal in antenna: 1mV, with ″Philips″ test signal
- Input video signal on SCART connector: 1 Vpp
- Input audio signal on SCART connector: 500 mVeff
- Brightness, contrast and colour of picture, volume of sound set to normal (near middle of scale)
- Measure DC voltages with digital voltmeter with 1% precision
- Measuring instrument (voltmeter or oscilloscope) connect to tuner ground during measuring on secondary side of mains (SMPS) transformer and on primary side during measuring on primary side SMPS supply circuit.

# BLOCK DIAGRAM AND OPTIONS TABLES

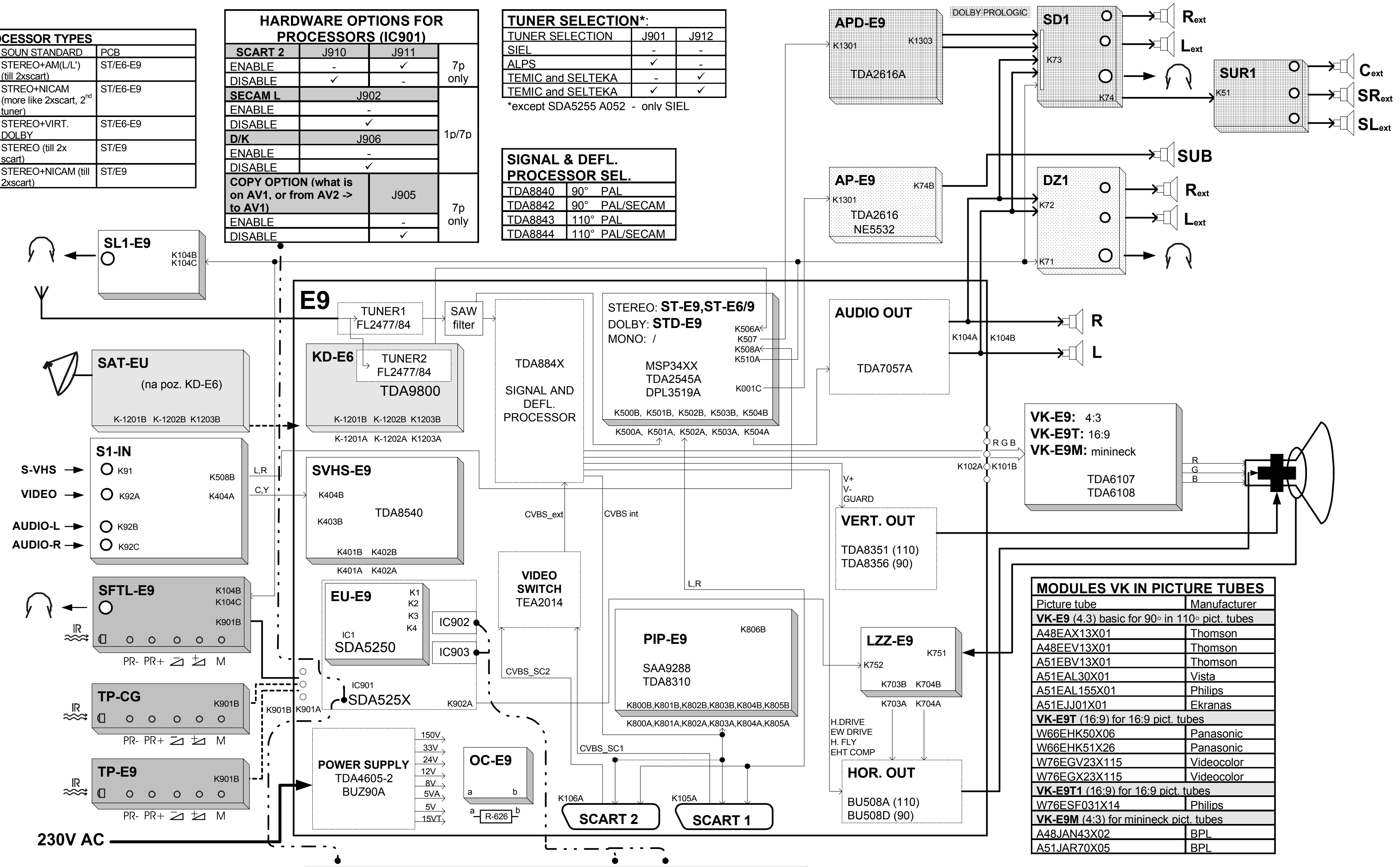
| SOUN PROCESSOR TYPES | | |
|---|---|---|
| TYPE | SOUN STANDARD | PCB |
| TDA 3400 | STEREO+AM(L/L') (till 2xscart) | ST/E6-E9 |
| TDA 3410D | STREO+NICAM (more like 2xscart, 2nd tuner) | ST/E6-E9 |
| TDA 3401 G | STEREO+VIRT. DOLBY | ST/E6-E9 |
| TDA 3401 | STEREO (till 2x scart) | ST/E9 |
| TDA 3415 | STEREO+NICAM (till 2xscart) | ST/E9 |

| HARDWARE OPTIONS FOR PROCESSORS (IC901) | | | |
|---|---|---|---|
| **SCART 2** | J910 | J911 | 7p only |
| ENABLE | - | ✓ | |
| DISABLE | ✓ | - | |
| **SECAM L** | J902 | | 1p/7p |
| ENABLE | - | | |
| DISABLE | ✓ | | |
| **D/K** | J906 | | |
| ENABLE | - | | |
| DISABLE | ✓ | | |
| **COPY OPTION (what is on AV1, or from AV2 -> to AV1)** | | J905 | 7p only |
| ENABLE | | - | |
| DISABLE | | ✓ | |

| TUNER SELECTION*: | | |
|---|---|---|
| TUNER SELECTION | J901 | J912 |
| SIEL | - | - |
| ALPS | ✓ | - |
| TEMIC and SELTEKA | - | ✓ |
| TEMIC and SELTEKA | ✓ | ✓ |

*except SDA5255 A052 - only SIEL

| SIGNAL & DEFL. PROCESSOR SEL. | |
|---|---|
| TDA8840 | 90° PAL |
| TDA8842 | 90° PAL/SECAM |
| TDA8843 | 110° PAL |
| TDA8844 | 110° PAL/SECAM |

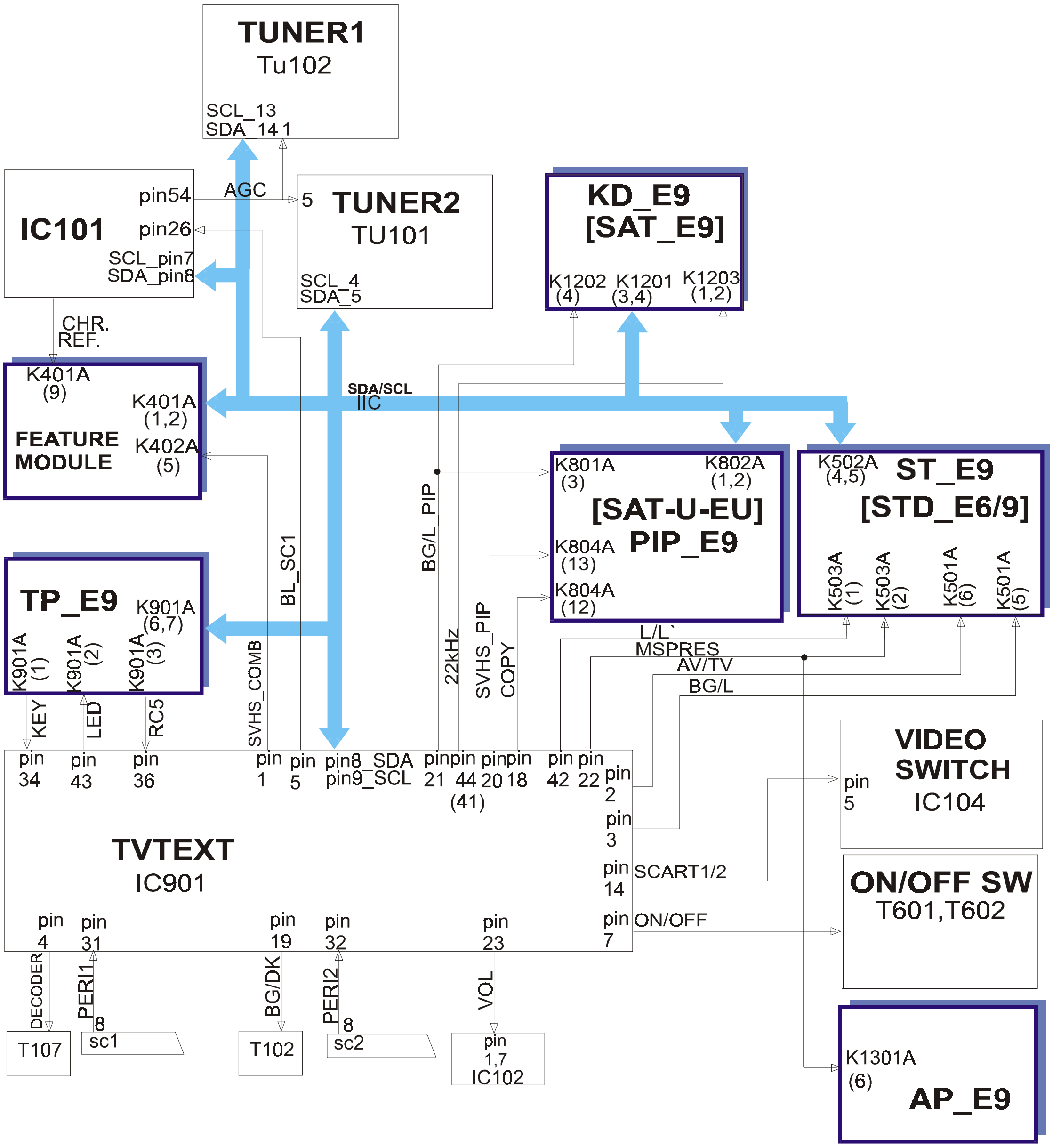



| MODULES VK IN PICTURE TUBES | |
|---|---|
| Picture tube | Manufacturer |
| **VK-E9** (4.3) basic for 90◦ in 110◦ pict. tubes | |
| A48EAX13X01 | Thomson |
| A48EEV13X01 | Thomson |
| A51EBV13X01 | Thomson |
| A51EAL30X01 | Vista |
| A51EAL155X01 | Philips |
| A51EJJ01X01 | Ekranas |
| **VK-E9T** (16:9) for 16:9 pict. tubes | |
| W66EHK50X06 | Panasonic |
| W66EHK51X26 | Panasonic |
| W76EGV23X115 | Videocolor |
| W76EGX23X115 | Videocolor |
| **VK-E9T1** (16:9) for 16:9 pict. tubes | |
| W76ESF031X14 | Philips |
| **VK-E9M** (4:3) for minineck pict. tubes | |
| A48JAN43X02 | BPL |
| A51JAR70X05 | BPL |

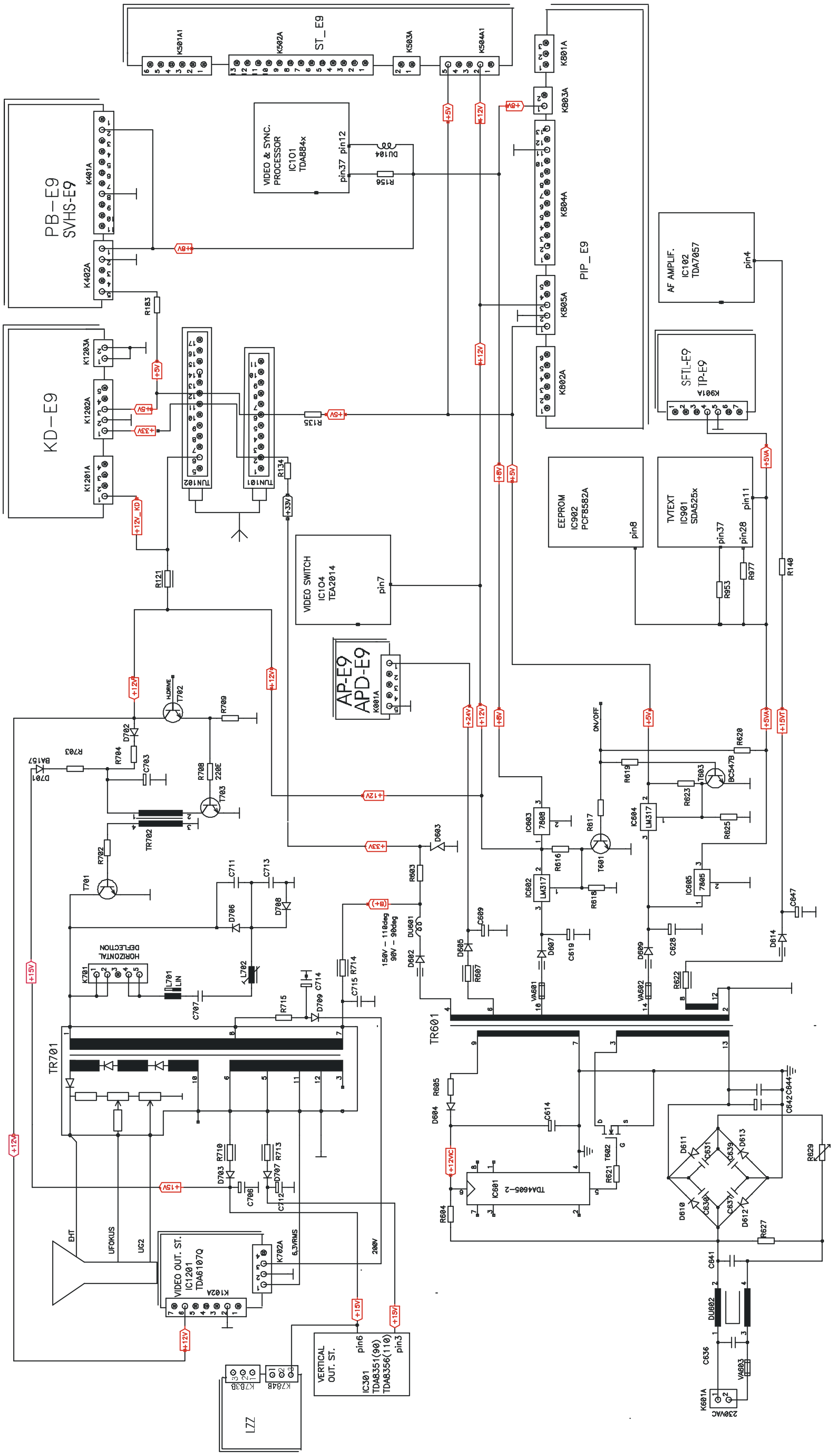
10.12.1999

| PROCESSOR & EEPROM SELECTION | | | | |
|---|---|---|---|---|
| **IC901** | Text pages | **IC902** | **IC903** | Optional no. languaes |
| SDA5252-2 B001 EV E9 1P 17 99 | 1p | 24C08 | / | / |
| SDA5255 B002 EV E9 1P 19 99 | 1p | 24C08 | / | / |
| SDA5255 A052 | 7p | 24C16 or 24C08AT | / | up to 1 |
| SDA5255-2 B001 EV E9 7P 27 99 | 7p | | | |
| SDA5255 B003 EV E9 7P 29 99 | 7p | | 24C32 | up to 4 |
| Piggy back with SDA 5250 | 7p | | | |
| SDA545x OTP | 1p/7p | | | |

## BLOCK DIAGRAM – CONTROL SIGNALS



# BLOCK DIAGRAM - SUPPLY VOLTAGES



# SERVICE ADJUSTMENTS OF THE COLOUR TV WITH E9 CHASSIS

All necessary adjustments and settings are performed during manufacture of TV set and assure its correct operation when connected to the mains voltage and antenna or external video or audio signal. When TV set requires service intervention all settings should be checked and corrected, if necessary.

## DEMAGNETISING OF PICTURE TUBE

Correctness of picture tube demagnetising is usually automatically checked. Magnetisation of picture tube is presented as one or more colour "clouds", consequently colour reproduction of the picture is not correct.
Each time the TV set is switched on with mains switch, demagnetising system is activated. For correct demagnetising procedure disconnect the TV set with mains switch and leave it disconnected for about 15 minutes. Afterwards when you switch on the TV, demagnetising procedure is performed. In case distortion of colour reproduction still persists, special demagnetising coil should be used.

| ***ADJUSTMENT*** | ***ADJUSTMENT CONDITION*** | ***ADJUSTMENT ACTIVITY AND RESULT OF SETTINGS*** |
|---|---|---|
| **1. SUPPLY VOLTAGE FOR HORIZONTAL OUTPT STAGE »B+«** | • Connect the TV set to supply voltage 175…250VAC.<br>• Switch it on and set it by means of remote controller to AV mode of operation.<br>• Connect DC voltmeter to **D-602** cathode. | With **P-601** potentiometer set supply voltage for horizontal output stage to:<br>• 90° CTV: 118V ±0,2V<br>• 110° CTV: 155V ±0,2V<br>• 110°/16:9 CTV: 155V ±0,2V |

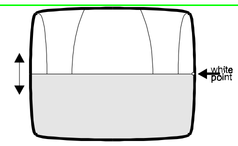
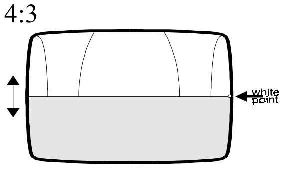
### SWITCHING TO SERVICE MODE

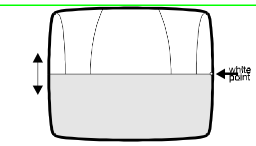
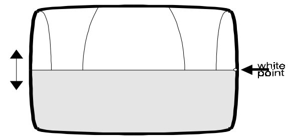
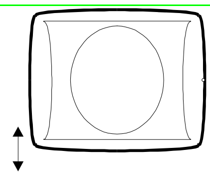
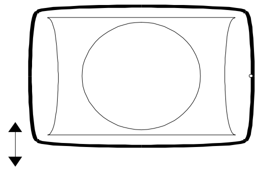
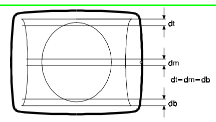
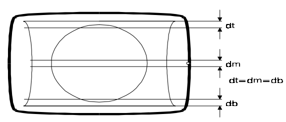
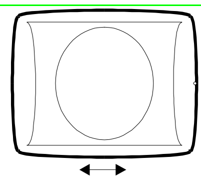
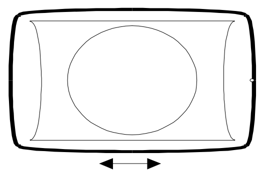
All other service settings of TV set are made in so called service mode of TV set operation. To enter this mode of operation press the keys in the following sequence: "**TV**", "**I**", and "**STOP**" in the period of 5 seconds from switching on the TV set to normal mode of operation. When the TV set is switched over to service mode the following status line with service parameter and parameter value appears on the screen:

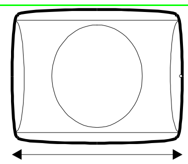
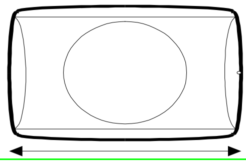
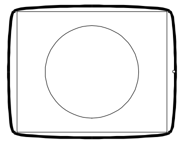
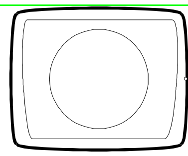
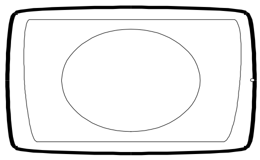
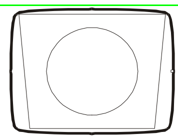
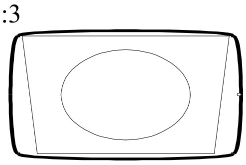
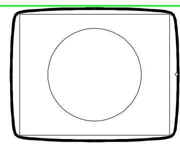
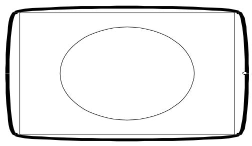
**SERVICE PARAM: XX VALUE: xx**

The parameter to be set is selected with keys ▲▼ (P+/P-), and selected parameter is set with keys ◄► (volume+ /volume-). Each time you press the key for parameter selection (▲▼) the value of preselected parameter is stored. Therefore when the last setting is performed you must press one of the two keys once again. Values of individual parameters are expressed in hexadecimal form due to limited capacity of the memory. Values of individual parameters are variable from 0 to 3F, with the exception of parameters 11, 12 and 13 where values are changed from 0 to 7F and O1, O2, O3, O4, which have value range between 0 and FF.
When setting is finished it should obligatory be concluded with "STOP" key. After a few seconds the status line disappears and service adjustment is accomplished.

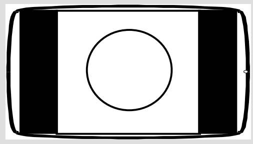
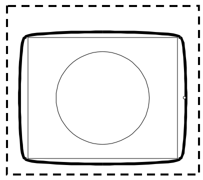
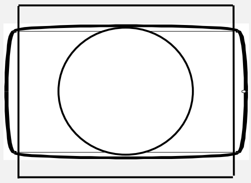
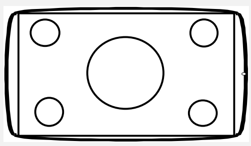
**NOTE: In case service adjustment is not ended in above specified mode (e.g. power supply breakdown), the adjustment should be repeated.**

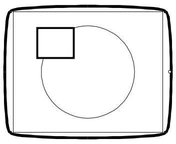
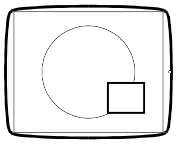
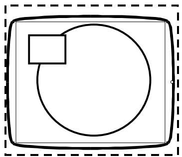
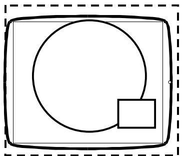
| | | | |
|---|---|---|---|
| **2. VERTICAL PICTURE POSITION** | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following service setting on the screen:<br><br>SERVICE PARAM: VH VALUE: xx | • With remote controller set vertical position of the picture: beginning of dark part of the picture should be exactly in the centre of the screen (two bright points on left and right side of the screen). | <br>4:3<br><br>16:9 |

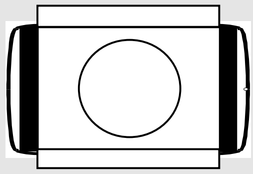
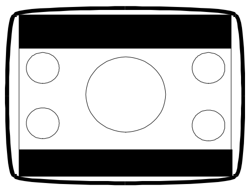
| ADJUSTMENT | ADJUSTMENT CONDITION | ADJUSTMENT ACTIVITY AND RESULT OF SETTINGS | |
|---|---|---|---|
| **3. VERTICAL AMPLITUDE ON TOP PART OF SCREEN** | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following service setting on the screen:<br>SERVICE PARAM: VA VALUE: xx | • With remote controller set vertical amplitude of picture on top, visible part of the screen. The beginning of test picture should be at the beginning of top part of the screen. | <br><br>4:3<br><br><br>16:9 |
| **4. VERTICAL AMPLITUDE ON BOTTOM PART OF SCREEN** | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following service setting on the screen:<br>SERVICE PARAM: VS VALUE: xx | • With remote controller set vertical amplitude of picture on bottom part of the screen. The lower part of test picture should be at the edge of bottom part of the screen. During this setting the picture on the screen top part of the screen should not change. | <br>4:3<br><br>16:9 |
| **5. CORRECTION OF "S" VERTICAL PICTURE DISTORTION** | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following service setting on the screen:<br>SERVICE PARAM: SC VALUE: xx | • With remote controller correct the picture. The distances between the two horizontal lines of test picture in the centre of the screen should be equal to the distances on top and bottom part of the screen. If after this setting vertical amplitude of picture changes, see pos. 5 and 6. | <br><br>4:3<br><br><br>16:9 |
| **6. HORIZONTAL PICTURE POSITION** | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following setting on the screen:<br>SERVICE PARAM: HS VALUE: xx | • With remote controller set test picture to the centre of the screen (if necessary first widen the picture, see pos. 7). | <br>4:3<br><br>16:9 |

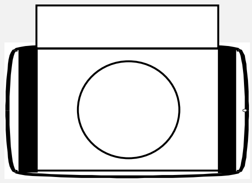
| ADJUSTMENT | ADJUSTMENT CONDITION | ADJUSTMENT ACTIVITY AND RESULT OF SETTINGS | |
|---|---|---|---|
| **7. HORIZONTAL AMPLITUDE OF PICTURE**<br>*ADJUST ONLY AT:*<br>- *110°-4:3*<br>- *16:9* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following service setting on the screen:<br>SERVICE PARAM: EW VALUE: xx | • With remote controller set picture width. Edges of test picture should be just hidden behind the edges of the screen. | <br> |
| **7/A. HORIZONTAL AMPLITUDE OF PICTURE FOR 90°**<br>*ADJUST ONLY AT:*<br>- *90°* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• For CTV is not necessary to be in service mode. | • With coil L702 set picture width. Edges of test picture should be just hidden behind the edges of the screen. |  |
| **8. CORRECTION OF PICTURE HORIZONTAL PINCUSHION DISTORTION**<br>*ADJUST ONLY AT:*<br>- *110°-4:3*<br>- *16:9* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following service setting on the screen:<br>SERVICE PARAM: PW VALUE: xx | • With remote controller correct the picture. On left and right side of test picture straight lines should appear (especially in the centre of the picture). | <br>4:3<br><br>16:9 |
| **9. CORRECTION OF PICTURE HORIZONTAL PINCUSHION DISTORTION IN CORNERS OF THE SCREEN**<br>*ADJUST ONLY AT:*<br>- *110°-4:3*<br>- *16:9* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following service setting on the screen:<br>SERVICE PARAM: CP VALUE: xx | • With remote controller correct the picture. On left and right part of test picture straight lines should appear also in corners of the screen. | <br>4:3<br><br>16:9 |
| *10.* **CORRECTION OF PICTURE TRAPEZIUM DISTORTION**<br>*ADJUST ONLY AT:*<br>- *110° -4:3*<br>- *16:9* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following service setting on the screen:<br>SERVICE PARAM: TC VALUE: xx | • With remote controller correct the picture. On left and right part of test picture perfectly straight and vertical lines should appear. | <br>4:3<br><br>16:9 |

REMARK:
If after correcting pincushion and trapezoidal distortion, changes the horizontal amplitude of picture, is necessary to correct also horizontal amplitude of picture according to explanation in point 7.

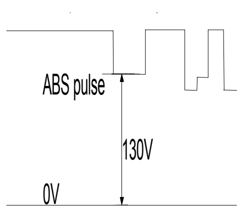
| ADJUSTMENT | ADJUSTMENT CONDITION | ADJUSTMENT ACTIVITY AND RESULT OF SETTINGS | |
|---|---|---|---|
| **11. HORIZONTAL AMPLITUDE FOR 16:9 PICTURE TUBES**<br><br>*ADJUST ONLY AT:*<br>*- 16:9* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following service setting on the screen:<br><br>SERVICE PARAM: EW VALUE: xx | • With remote controller set picture width. Correct 4:3 picture geometry should be obtained. |  |
| **12 ZOOM OF PICTURE GEOMETRY (4:3)**<br><br>*ADJUST ONLY AT:*<br>*- 4:3* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following setting:<br><br>SERVICE PARAM: X1 VALUE: xx<br><br>• Select the following setting:<br>SERVICE PARAM: E1 VALUE: xx<br><br>• Select the following setting:<br>SERVICE PARAM: S1 VALUE: xx | • Set vertical geometry of picture. The picture should expand up to first horizontal white line on test picture.<br>• Increase horizontal amplitude of picture. The picture should be expanded up to the first vertical white line on test picture.<br>• Set the picture to the centre of the screen (if necessary). | <br>hatched line: expand (ZOOM) picture |
| **12/A. »MOVIE EXPAND« GEOMETRY OF ZOOM PICTURE (16:9)**<br><br>REMARK:<br>The setting enables reproduction of 4:3 picture through entire 16:9 screen (with cut off edges on top and bottom side) and "letterbox" picture without black edges. This format is also automatically selected if WSS code is present *(PALplus).*<br><br>*ADJUST ONLY AT:*<br>*- 16:9* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with 16:9 "letterbox" test picture.<br>• Select the following setting:<br>SERVICE PARAM: X1 VALUE: xx<br><br>• Select the following setting:<br>SERVICE PARAM: E1 VALUE: xx<br><br>• Select the following setting:<br>SERVICE PARAM: S1 VALUE: xx | • Set vertical geometry of the picture. The picture should be expanded up to the edges of the test on top and bottom side.<br>• Set horizontal amplitude of picture. The picture should be expanded up to the edge of test.<br>• Set position of the picture to the centre of the screen. | <br>4:3 picture<br><br>»letterbox picture« |

| ADJUSTMENT | ADJUSTMENT CONDITION | ADJUSTMENT ACTIVITY AND RESULT OF SETTINGS | |
|---|---|---|---|
| **13. PIP PICTURE POSITION ON LEFT SIDE**<br>*Adjust only at CTV with PIP module.* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following setting:<br>SERVICE PARAM: P1 VALUE: xx | • With remote controller set desired PIP position of picture. |  |
| **14. PIP PICTURE POSITION ON RIGHT SIDE**<br>*Adjust only at CTV with PIP module.* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following setting:<br>SERVICE PARAM: P2 VALUE: xx | • With remote controller set desired PIP position of picture. |  |
| **15. PIP PICTURE POSITION ON LEFT SIDE (ZOOM)**<br>*Adjust only at CTV with PIP module.* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following setting:<br>SERVICE PARAM: P3 VALUE: xx | • With remote controller set desired position of PIP picture when picture is expanded. |  |
| **16. PIP PICTURE POSITION ON RIGHT SIDE (ZOOM)**<br>*Adjust only at CTV with PIP module.* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following setting:<br>SERVICE PARAM: P4 VALUE: xx | • With remote controller set desired position of PIP picture when picture is expanded.. |  |

| ADJUSTMENT | ADJUSTMENT CONDITION | ADJUSTMENT ACTIVITY AND RESULT OF SETTINGS | |
|---|---|---|---|
| **17. »ZOOM1« GEOMETRY OF ZOOM PICTURE (16:9)**<br><br>*The setting enables reproduction of 4:3 expanded picture on 16:9 screen (black edges on left and right side decrease, a part of picture at top and bottom is cut off). Setting is possible only when colour TV is configured for 16:9 picture tubes).*<br><br>*ADJUST ONLY AT:*<br>*- 16:9* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br><br>• Select the following setting: SERVICE PARAM: X2 VALUE: xx<br><br>• Select the following setting: SERVICE PARAM: E2 VALUE: xx<br><br>• Select the following setting: SERVICE PARAM: S2 VALUE: xx | • Set vertical geometry of picture which should be expanded up to the first horizontal white line on test picture of page.<br><br>• Set picture width so as to get correct 4:3 picture geometry.<br><br>• Set picture position in the centre of the screen. | <br>»ZOOM1« |
| **17/A. »ZOOM1« GEOMETRY OF ZOOM PICTURE AT 4:3**<br><br>*The setting enables correct reproduction of »letterbox« picture on 4:3 screen (black edges on top and bottom).* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with letterbox 16:9 test picture.<br><br>• Select the following setting: SERVICE PARAM: X2 VALUE: xx<br><br>• Select the following setting: SERVICE PARAM: E2 VALUE: xx<br><br>• Select the following setting: SERVICE PARAM: S2 VALUE: xx | • Set vertical geometry of picture as long as circle get correct round form in letterbox test picture.<br>.<br>• Set picture width as long as the edges of test picture should be just hidden behind the edges of the screen.<br><br>• Set picture position in the centre of the screen. | <br>*»Letterbox« on 4:3 picture tube* |

| ADJUSTMENT | ADJUSTMENT CONDITION | ADJUSTMENT ACTIVITY AND RESULT OF SETTINGS | |
|---|---|---|---|
| **18. »ZOOM2« GEOMETRY OF ZOOM PICTURE (16:9)**<br><br>*The setting enables reproduction of 4:3 expanded picture on 16:9 screen (black edges on left and right side decrease, a part of top part of picture is cut off so that subtitles are visible.*<br>*Setting is possible only in case the colour TV is configured for 16:9 picture tubes.*<br><br>*ADJUST ONLY AT:*<br>*- 16:9* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br><br>• Select the following setting:<br>SERVICE PARAM: X3 VALUE: xx<br><br>• Select the following setting:<br>SERVICE PARAM: E3 VALUE: xx<br><br>• Select the following setting:<br>SERVICE PARAM: S3 VALUE: xx | • Set vertical geometry of picture which should be expanded up to the first horizontal white line on test picture of page.<br><br>• Set picture width so as to get correct 4:3picture geometry.<br><br>• Set picture position. Picture should be shifted upwards (bottom edge of picture up to bottom edge of screen). | <br>»ZOOM2«<br>(»Titled Movie Expand) |
| **19. OPERATING THRESHOLD OF AUTOMATIC AMPLIFICATION REGULATION** | • To antenna connector of TV set, which is set to channel 12, connect VF signal source of frequency 224,25 MHz (C12) with RF amplitude 60dB/uV (1mV/75E).<br>• Connect voltmeter, dc, on C107.<br>• Switch the TV set to service mode of operation.<br>• Select the following service setting:<br><br>SERVICE PARAM: AC VALUE: xx | • With remote controller keep changing the value of AC setting until 7.5V±0,5V appears on voltmeter display.<br><br>REMARK: If in chassis is inserted WW form of tuner (small casing), with 5V supply, set on voltmeter value 2,8V±0,1V. | |
| **20. RED COMPONENT OF WHITE** | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following service setting:<br>SERVICE PARAM: R VALUE: xx | • With remote controller set value:<br>1F: Pict. Tube Philips, Panasonic.<br>1F: Pict. Tube Thomson.<br><br>This value is for orientation and depends of picture tube. | |

| ADJUSTMENT | ADJUSTMENT CONDITION | ADJUSTMENT ACTIVITY AND RESULT OF SETTINGS |
|---|---|---|
| **21. GREEN COMPONENT OF WHITE** | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following service setting:<br>SERVICE PARAM: G VALUE: xx | • With remote controller set value:<br>24: Pict. Tube Philips, Panasonic.<br>28: Pict. Tube Thomson.<br><br>This value is for orientation and depends of picture tube. |
| **22. BLUE COMPONENT OF WHITE** | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following service setting:<br>SERVICE PARAM: B VALUE: xx | • With remote controller set value:<br>24: Pict. Tube Philips, Panasonic.<br>20: Pict. Tube Thomson.<br><br>This value is for orientation and depends of picture tube. |
| **23. REFERENCE OSCILLATING CIRCUIT OF DEMODULATOR** | PAL /SECAM BG/L | |
| | • With remote controller select the following service setting:<br>SERVICE PARAM: I1 VALUE: xx | • With keys for set value changing set parameter value.<br>SERVICE PARAM: I1 VALUE:40 |
| | PAL /SECAM /L' | |
| | • With remote controller select the following service setting:<br>SERVICE PARAM: I2 VALUE: 00 | • With keys for set value changing set parameter value.<br>SERVICE PARAM: I2 VALUE: 00 |
| | PAL /SECAM /DK | |
| | • With remote controller select the following service setting:<br>SERVICE PARAM: I3 VALUE: 40 | • With keys for set value changing set parameter value.<br>SERVICE PARAM: I3 VALUE: 40 |
| **24. TIME DELAY OF LUMINANCE SIGNAL** | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture.<br>• Select the following setting:<br>SERVICE PARAM: YD VALUE:xx | • With remote controller set such delay setting that signals of colour and black - white picture overlap.<br><br>Recommended value: D |
| **25. MAX. VOLUME FOR HOTEL TV**<br>*Setting is possible only for colour TV configured for hotel TV.* | • Select the following setting:<br>SERVICE PARAM: HM VALUE: xx | • With remote controller set desired value of volume. |
| **26. OPTION BYTE 1** | • Select the following setting:<br>SERVICE PARAM: O1 VALUE: xx | • See option bytes. |
| **27. OPTION BYTE 2** | • Select the following setting:<br>SERVICE PARAM: O2 VALUE: xx | • See option bytes. |
| **28. OPTION BYTE 3** | • Select the following setting:<br>SERVICE PARAM: O3 VALUE: xx | • See option bytes. |
| **29. OPTION BYTE 4** | • Select the following setting:<br>SERVICE PARAM: O4 VALUE: xx | • See option bytes. |

| ADJUSTMENT | ADJUSTMENT CONDITION | ADJUSTMENT ACTIVITY AND RESULT OF SETTINGS | |
|---|---|---|---|
| **30. VOLTAGE FOR PICTURE TUBE BEAM FOCUSING** | • Switch the colour TV with STOP key on remote controller to normal mode of operation.<br>• Connect signal with Philips test picture to antenna connector. | • With potentiometer for focusing voltage adjustment on HV transformer set such value of voltage, that gives sharp picture on entire surface of the screen. Sharpness should be equal in corners and in centre of the screen. | |
| **31. VOLTAGE OF SECOND GRID OF $U_{G2}$ PICTURE TUBE** | Required instruments:<br>• oscilloscope,<br>• oscilloscope probe 100:1;<br>• Cp=2,5pF (oscilloscope setting 0,5V/div; 5ms/div: ext. actuation with vertical time basis of TV set).<br>Procedure:<br>• To antenna connector connect signal with Philips test picture.<br>• With oscilloscope probe search on video output stage for the cathode of picture tube on which video signal has highest voltage level of black (oscilloscope setting: 0,5V/div; 20 us/div: int. triggering). The probe should remain connected to this cathode.<br>• Change the setting of oscilloscope to 5ms/div and ext. Triggering with vertical time basis of TV set and on oscillogram search for measuring "ABS" impulse (automatic black point stabilisation). | • With potentiometer for second grid voltage adjustment on HV transformer set such value of »ABS« pulse to voltage 130±2 V. |  |
| **32. REFERENCE OSCILLATING CIRCUIT OF SOUND DEMODULATOR**<br><br>*Applies to stereo version of TV set.* | • To antenna connector of TV set, which is switched on and operates in service mode, connect VF signal source with PHILIPS test picture and with 1kHz modulated sound carrier. | • Connect oscilloscope probe IC525 to connector 12. | • Rotating the core of L521 coil set min. content of video signal. |

## OPTION BYTES

**Option bytes enable programme configuration of colour TV set. Changing individual bites of a byte modifies the characteristics of TV set.**

### O1:

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|

| BIT | 1 | 0 |
|---|---|---|
| 0 | NTSC ENABLE | NTSC DISABLE |
| 1 | BLUE BACK ENABLE | BLUE BACK DISABLE |
| 2 | DYNAMIC SCIN CORRECTION ANGLE 123º | DYNAMIC SCIN CORRECTION ANGLE 118º |
| 3 | DYNAMIC SCIN CONTROL ENABLE | DYNAMIC SCIN CONTROL DISABLE |
| 4 | BLUE STRATCH ENABLE | BLUE STRATCH DISABLE |
| 5 | BLACK STRATCH ENABLE | BLACK STRATCH DISABLE |
| 6 | HOTEL MODE ENABLE | HOTEL MODE DISABLE |
| 7 | COMB FILTER ENABLE | COMB FILTER DISABLE |

### O2:

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|

| BIT | 1 | 0 |
|---|---|---|
| 0 | PAL I ENABLE | PAL I DISABLE |
| 1 | MULTISTANDARD ENABLE (BG/DK- if option jumper not insert; I- if bit PAL I enable) | MULTISTANDARD DISABLE (if PAL I enable - only PAL I; BG/DK - if option jumper DK not insert) |
| 2 | HBL bit ENABLE | HBL bit DISABLE |
| 3 | OPTION LANGUAGE ENABLE | OPTION LANGUAGE DISABLE |
| 4 | 16:9 | 4:3 |
| 5 | TOP ENABLE | TOP DISABLE |
| 6 | USER SET 38 | USER SET 06 |
| 7 | HEADPHONE MENU DISABLE | HEADPHONE MENU ENABLE |

### O3:

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|

| BIT | 1 | 0 |
|---|---|---|
| 0 | CTI ENABLE | CTI DISABLE |
| 1 | WELCOME MESSAGE ENABLE | WELCOME MESSAGE DISABLE |
| 2 | MSP 3401 ENABLE | MSP3401 DISABLE |
| 3 | AUTOMATIC SWITCH ON (B SEC | 8 SEC. DELAYED SWITCH ON |
| 4 | AVL OPTION ENABLE | AVL DISABLE |
| 5 | HBL & TXT OFF (110 chassis) | HBL & TXT ON (ONLY pure TXT - not in UPDATE or MIX)<br>- 90 chassis – always ON |
| 6 | ZOOM is DISABLE (only 4:3) | ZOOM is ENABLE |
| 7 | ITALIAN CHANNELS (C13-C20) ENABLE | ITALIAN CHANNELS DISABLE |

**O4:**

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|

| BIT | 1 | 0 |
|---|---|---|
| 0 | LOW STANDBY ENABLE (save and read Zoom_settings at switch off and anew switch on) | LOW STANDBY DISABLE |
| 1 | AUTO ON ENABLE (for automatic switch on at connection to supply voltage) | AUTO ON DISABLE |
| 2 | ZET CORRECTION ENABLE (additional menu for setting rotation of picture) | ZET CORRECTION DISABLE |
| 3 & 4 | VIRTUAL OPTION | bit 4 bit 3 FUNCTION<br>0 0 SPACE effect<br>0 1 3D effect<br>1 0 VIRTUAL DOLBY effect<br>1 1 VIRTUAL DOLBY, but in MENU text 3D |
| 5 | DK ALTERNATE SOUND 6.5Mhz and 5.74MHz (RED button in menu ADJUST switching between 6.25 in 5.74 at DK sound standard) | DK SOUND 6.5MHz and 6.25MHz |
| 6 | | |
| 7 | | |

Option bytes are set so that besides selected option byte also hexadecimal number is set on the basis of above tables.

Example:

- blue back-enable
- dynamic scin control enable
- blue stratch enable

Select option byte O1 and for items, which should be activated, set "1" (other bites are "0"). In our case is as follows:

**O1:**

| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| **1** | | | | **A** | | | |

Shaded binary number should now be converted to hexadecimal value (darker frame). Afterwards set this value.

SERVICE PARAM: O1 VALUE: 1A

- **CAUTION: Option bytes are Factory adjusted and must NOT be changed later, because they change TV set characteristics.**

For conversion from binary to hexadecimal help us next table:

| BIN | | | | HEX |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 1 |
| 0 | 0 | 1 | 0 | 2 |
| 0 | 0 | 1 | 1 | 3 |
| 0 | 1 | 0 | 0 | 4 |
| 0 | 1 | 0 | 1 | 5 |
| 0 | 1 | 1 | 0 | 6 |
| 0 | 1 | 1 | 1 | 7 |
| 1 | 0 | 0 | 0 | 8 |
| 1 | 0 | 0 | 1 | 9 |
| 1 | 0 | 1 | 0 | A |
| 1 | 0 | 1 | 1 | B |
| 1 | 1 | 0 | 0 | C |
| 1 | 1 | 0 | 1 | D |
| 1 | 1 | 1 | 0 | E |
| 1 | 1 | 1 | 1 | F |

## 33. INFORMATION MENU ABOUT INTEGRIRATED CIRCUITS, CONNECTED TO $I^2C$-BUS

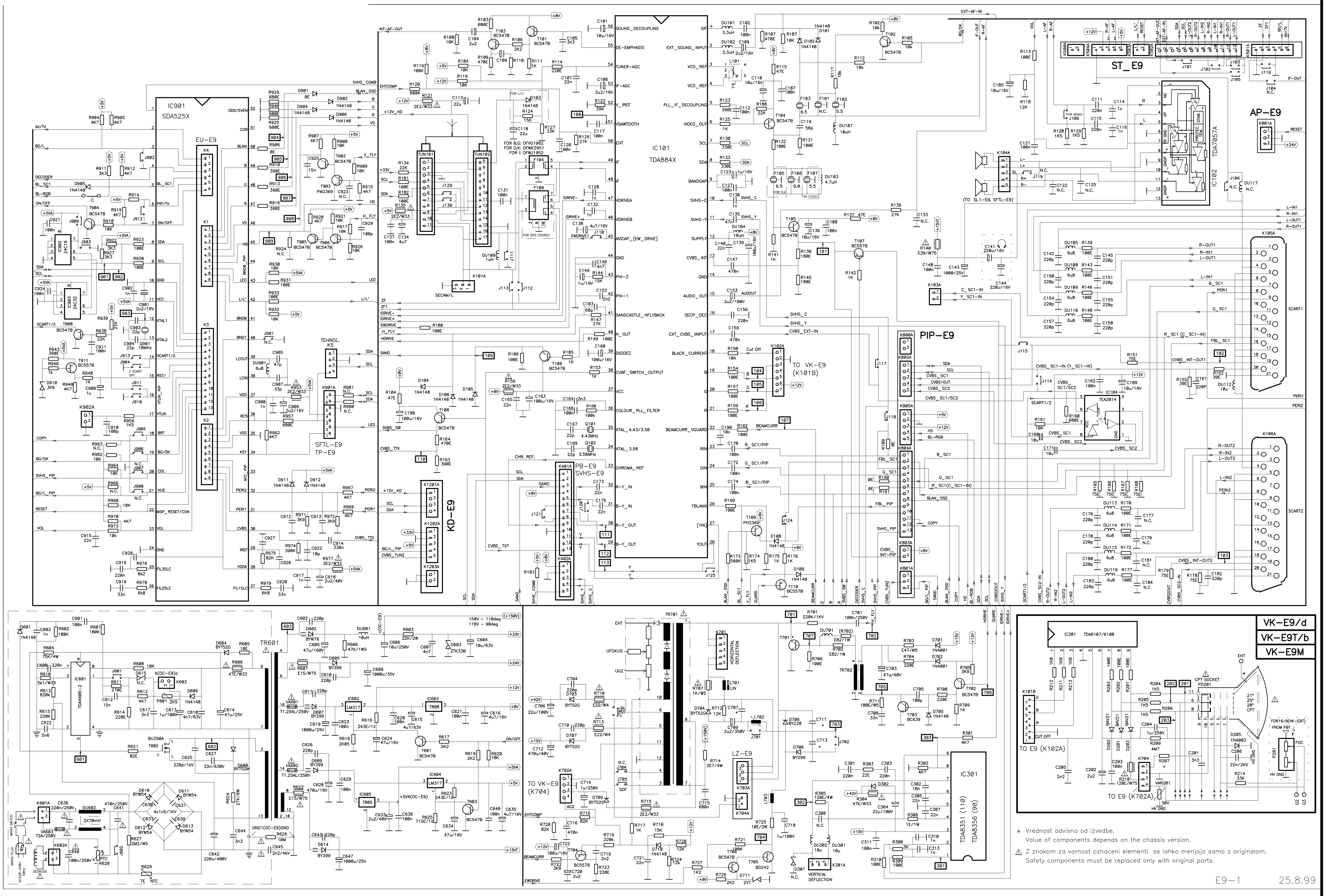
If you press **i** key (info) on remote control when the TV set is in service mode, you will get on the screen information about the version of current software (e.g.: VER:E9F1.6) and devices connected on $I^2C$ bus:

| SERVICE | | | |
|---|---|---|---|
| VER: E9F1.6 | | | |
| VIDEO PR. | OK | TDA8843 | |
| MSP 34XX | OK | | WD:00 |
| SDA9288 | XX | | SP:FF |
| TUNER2 | XX | | |
| TDA 8540 | | | |
| TDA8425 | | | |

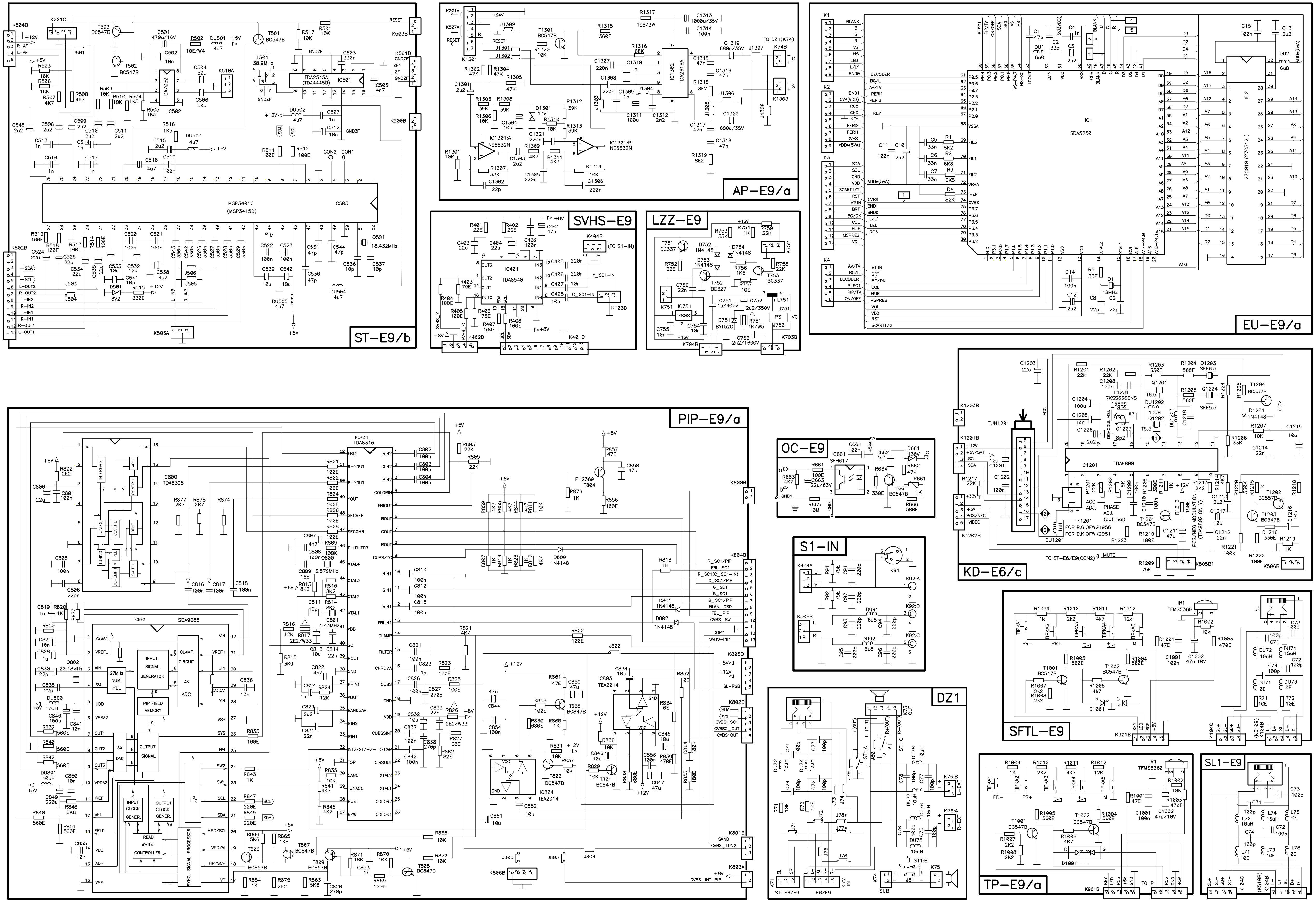
Video processor: Bus controlled TV processor for video and audio signal
MSP 34XX: Digital stereo sound processor
SDA 9288: PIP processor
TUNER2: Second tuner for PIP picture
TDA 8540: SVHS video matrix switch
TDA 8425: HI-FI Stereo audio processor for stereo through SCART connector

If device is installed and properly connected on $I^2C$ bus it will respond with "OK" beside the name of device, otherwise there will be "XX" on this place.

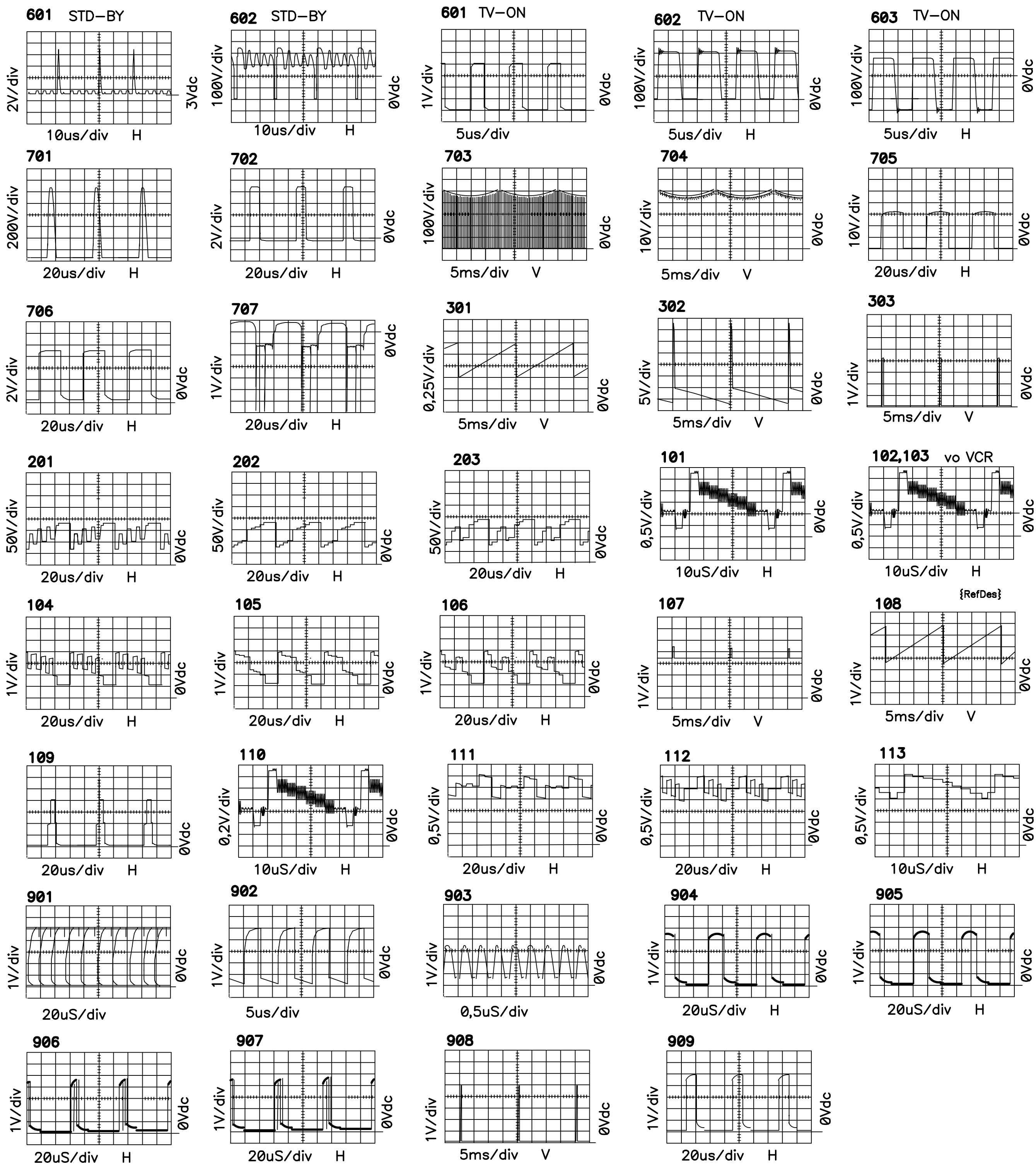
# ELECTRICAL DIAGRAM OF MAIN CHASSIS E9



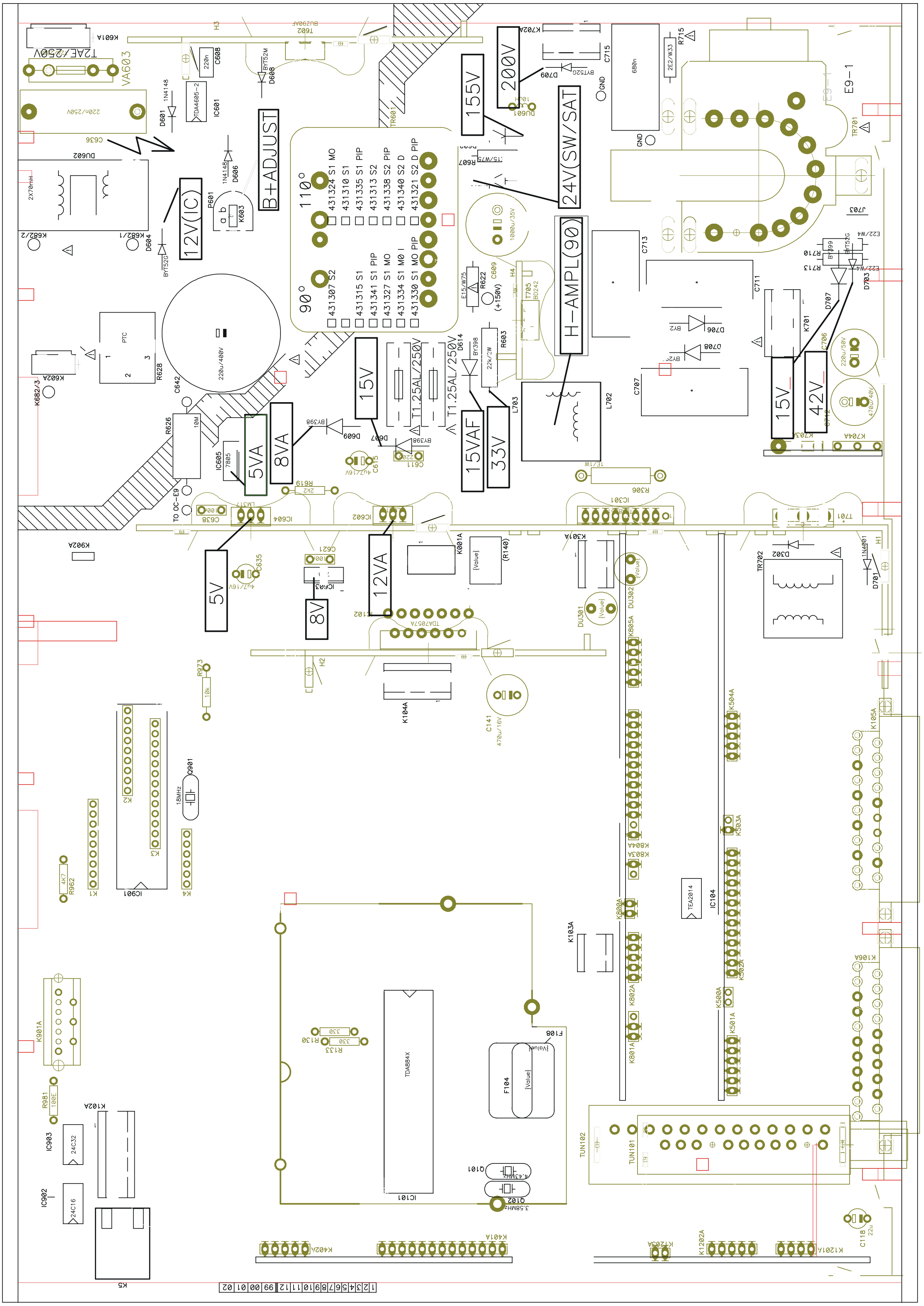
# ELECTRICAL DIAGRAM OF MODULES FOR CHASSIS E9



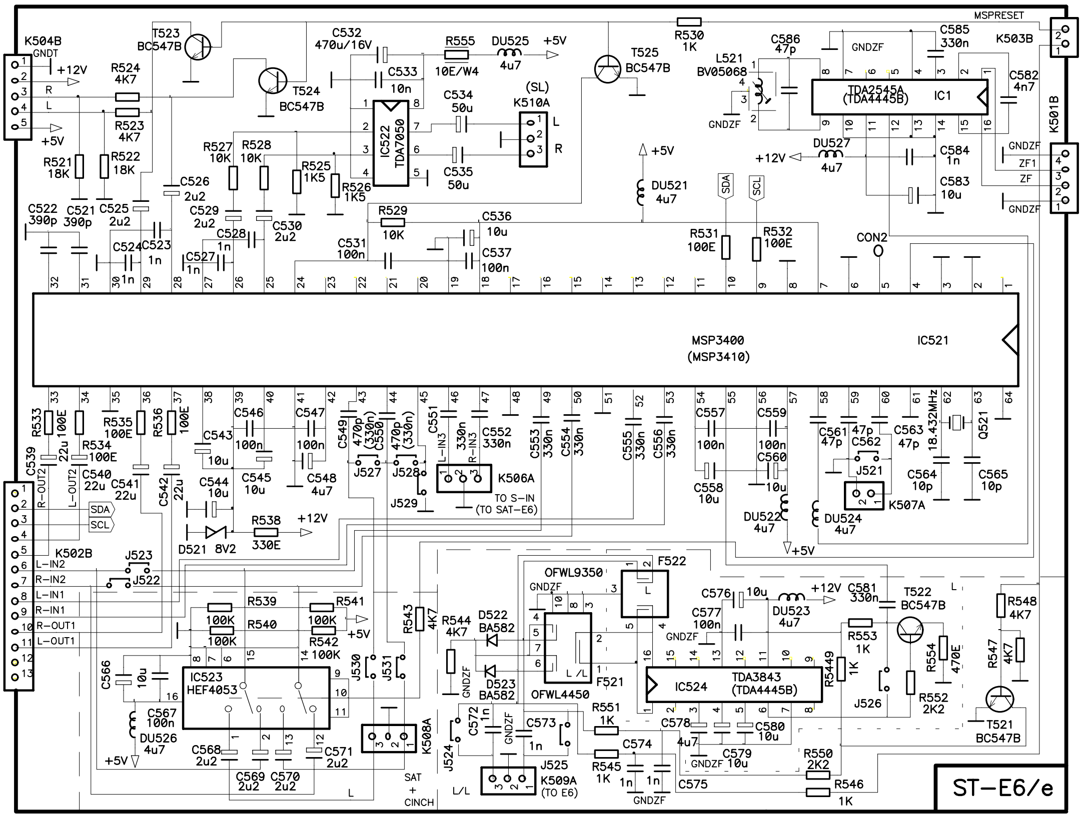
# OSCILLOGRAMS



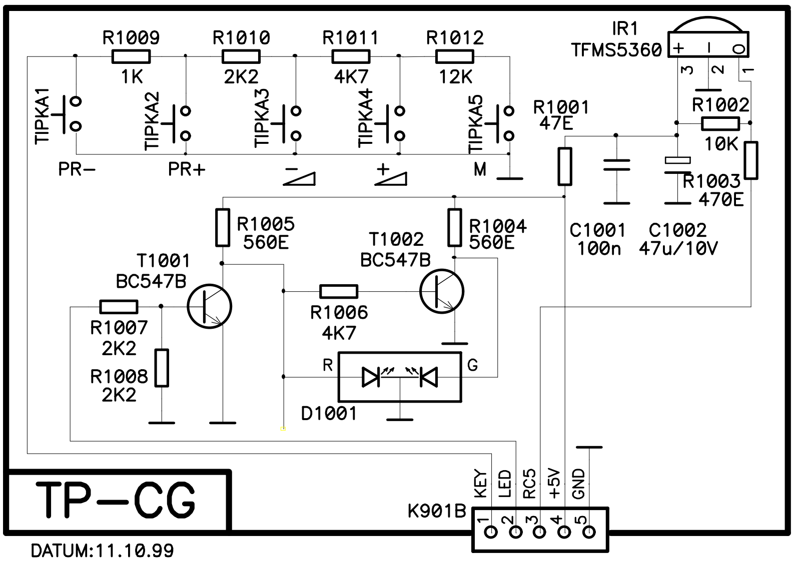
# MAIN CHASSIS – COMPONENT SIDE



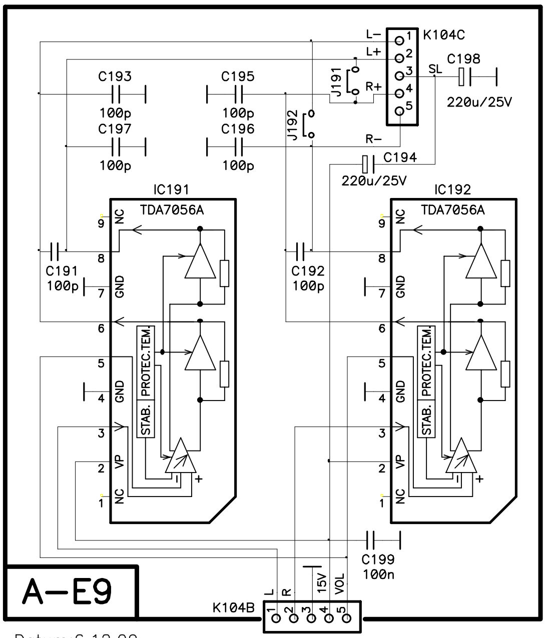
# ELECTRICAL DIAGRAMS OF SEPARATE MODULES OF CHASSIS E9



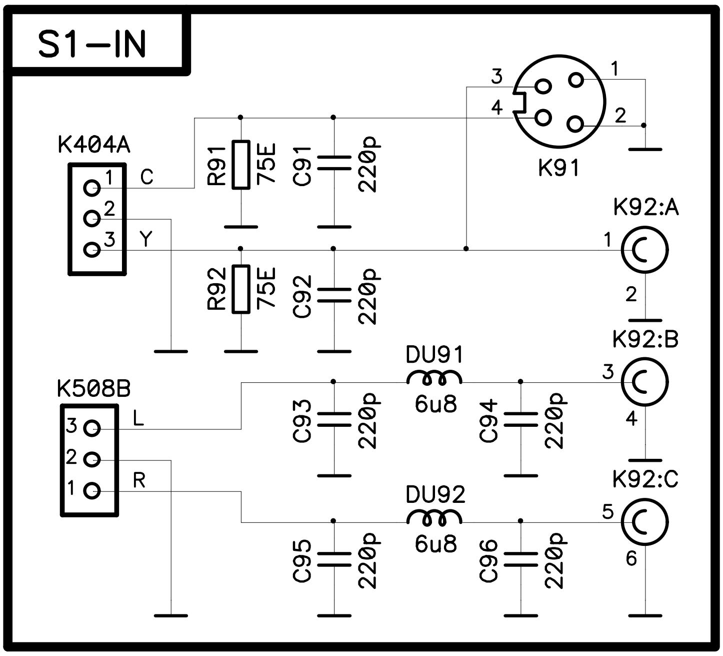

Datum:14.1.2000

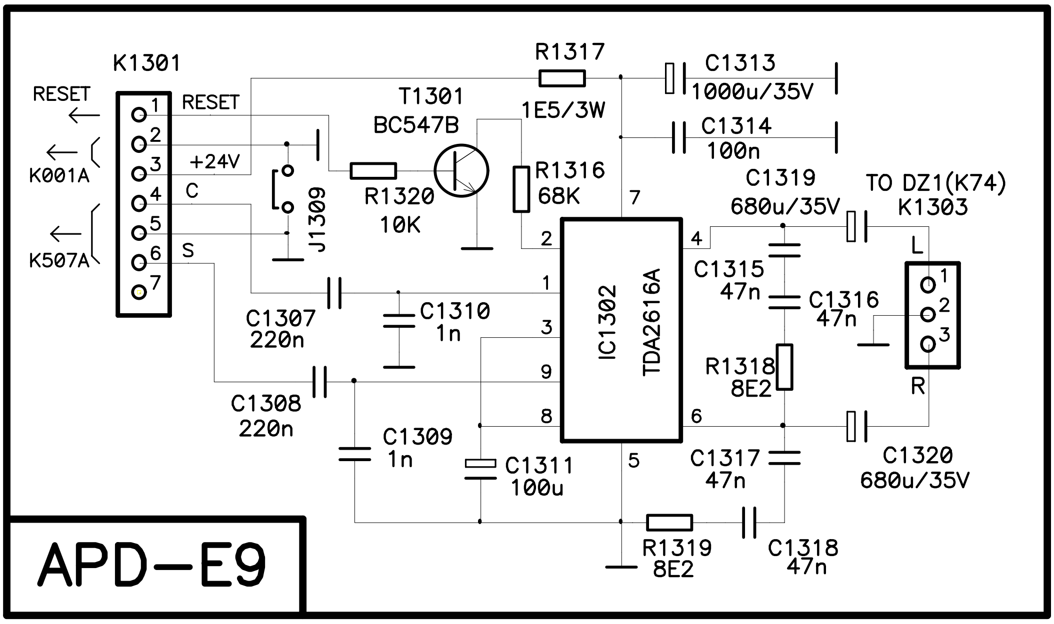



DATUM:11.10.99




Datum:6.12.99

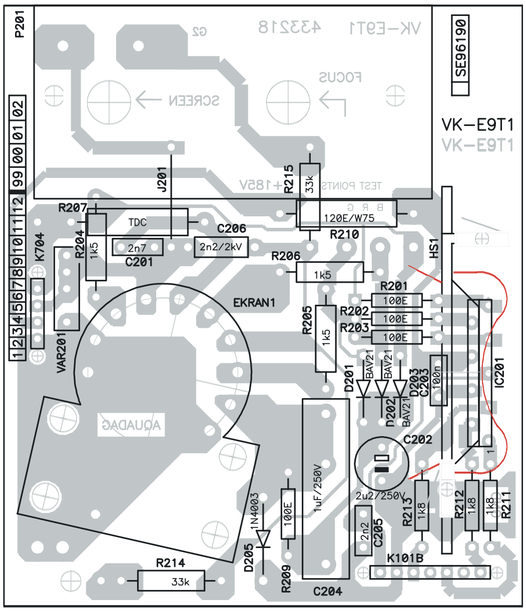


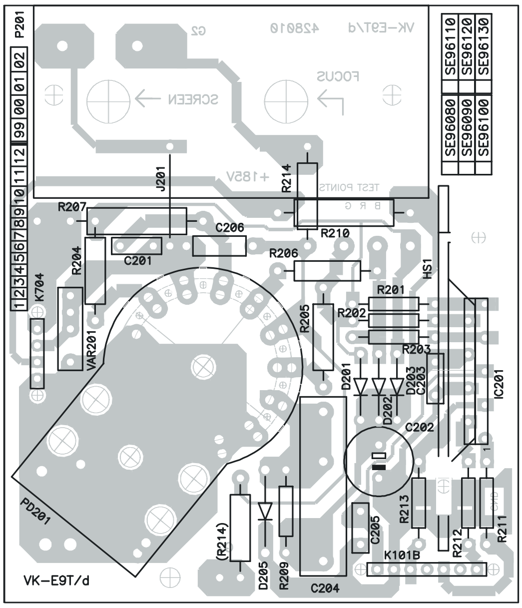

DATUM:1.4.99

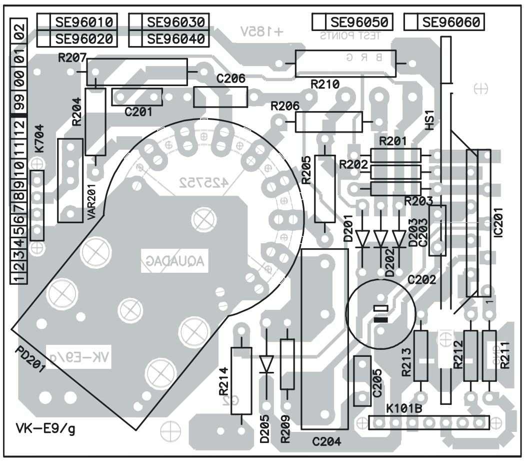
# COMPONENT LOCATIONS ON SEPARATE MODULES OF CHASSIS E9 – COMPONENT SIDE

VK-E9T1

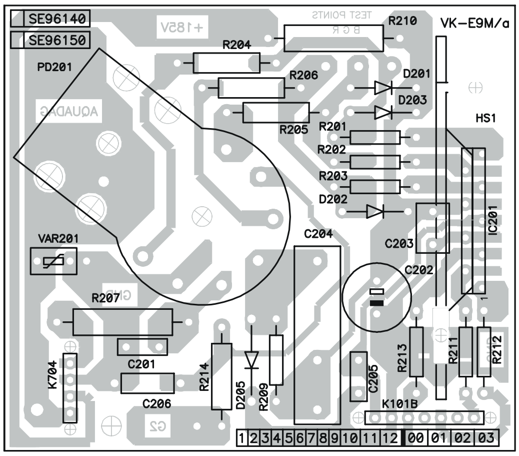


VK-E9T



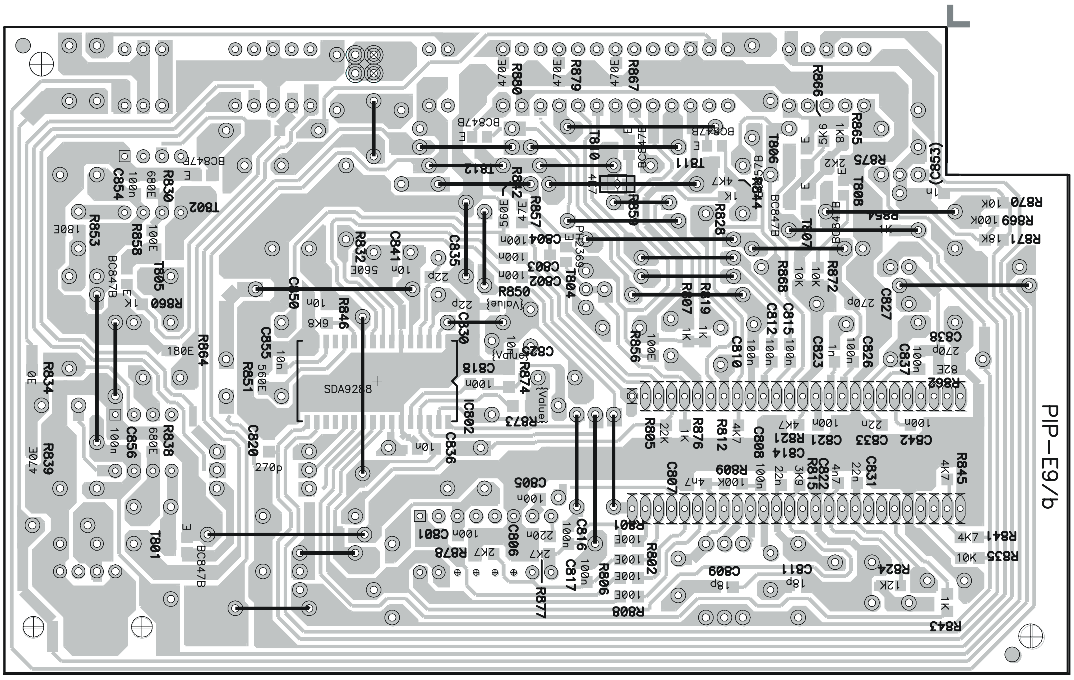


VK-E9

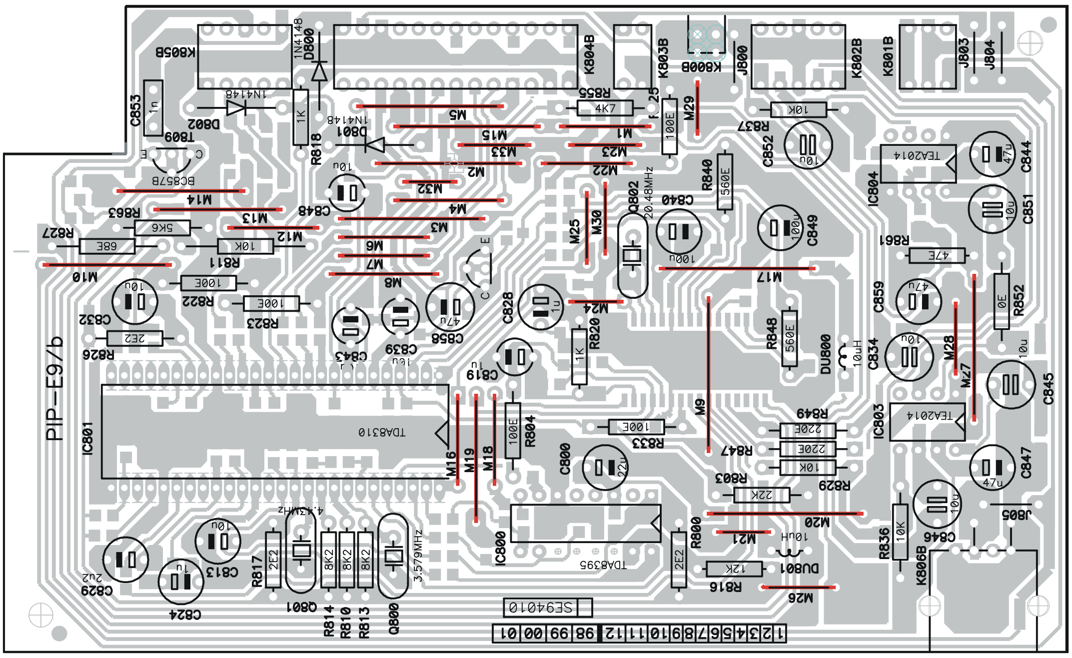


VK-E9M

# PIP-E9

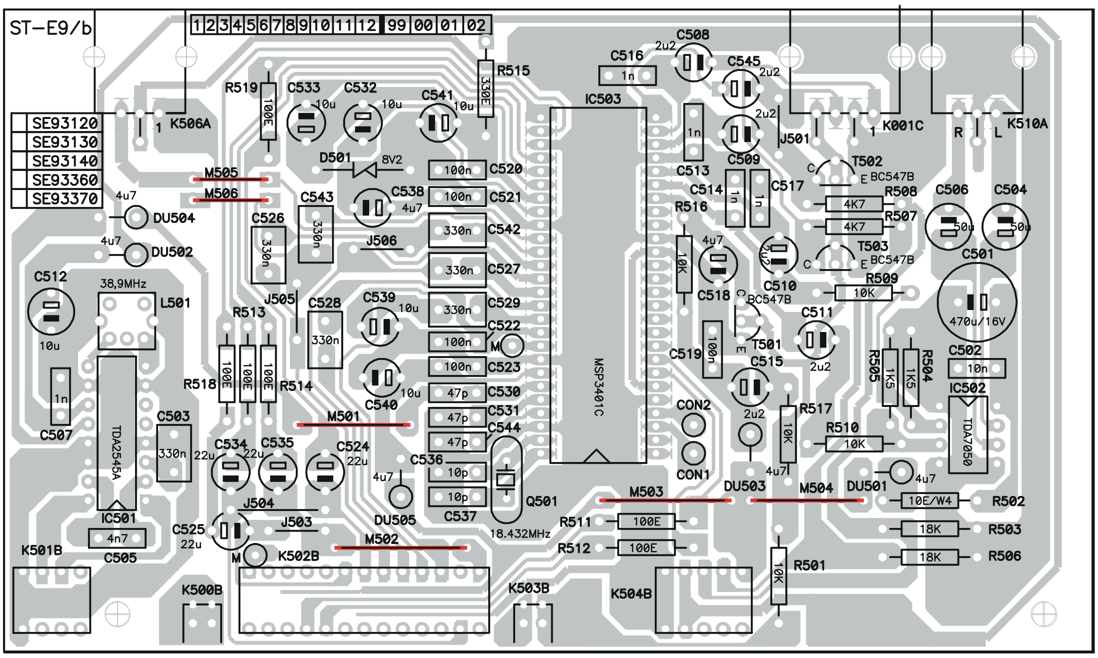


SOLDER SIDE

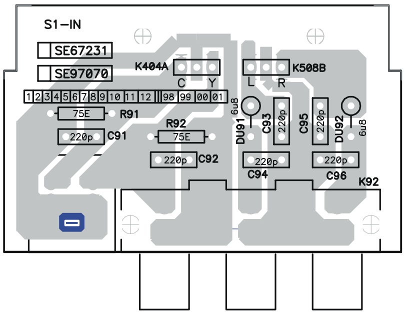


COMPONENT SIDE

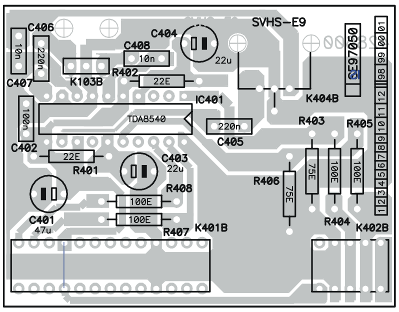
## ST-E9



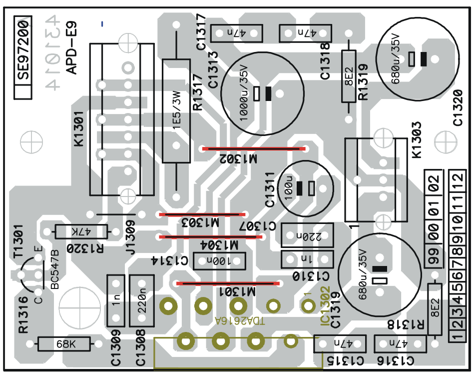

## S1-IN



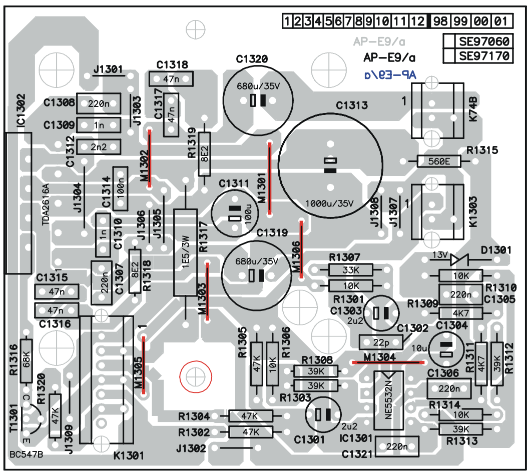

## SVHS-E9



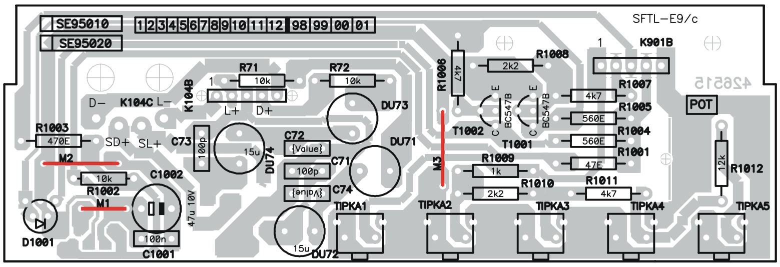

## APD-E9



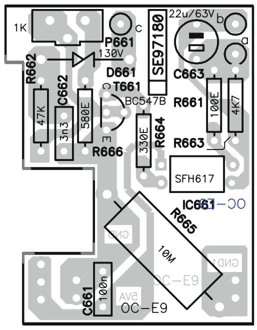

## AP-E9



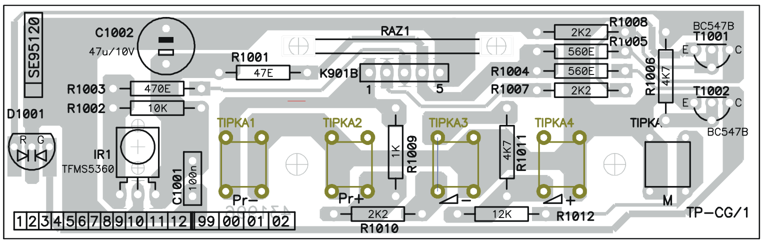
## SFTL-E9



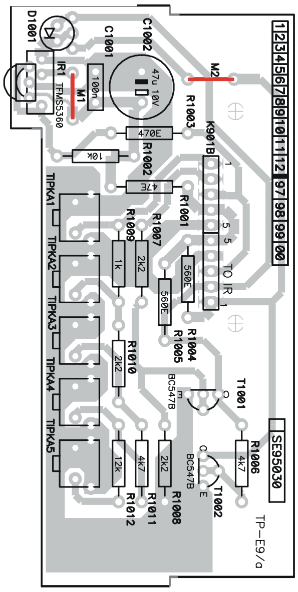
## OC-E9



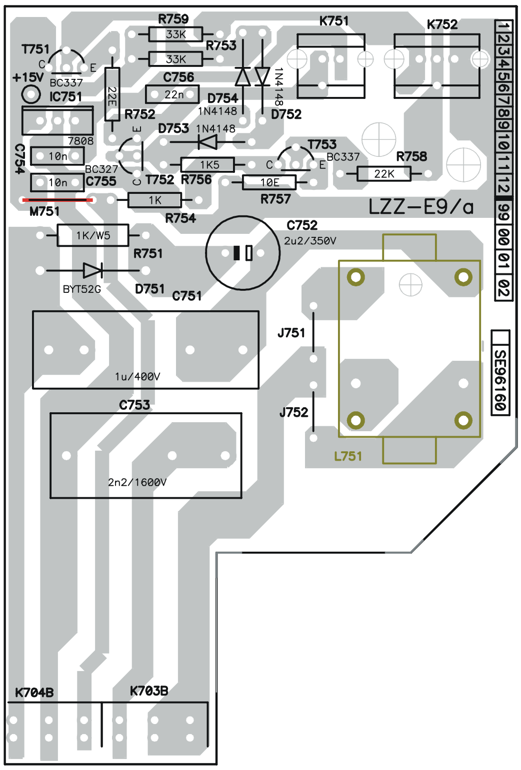
## TP-CG



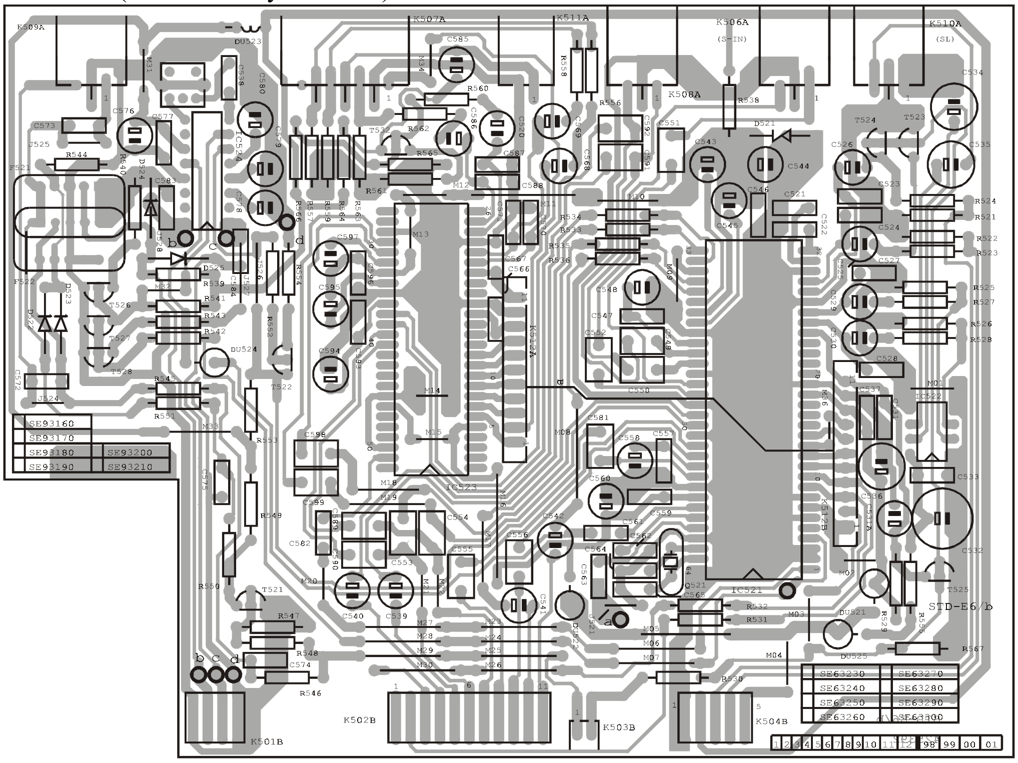
## TP-E9



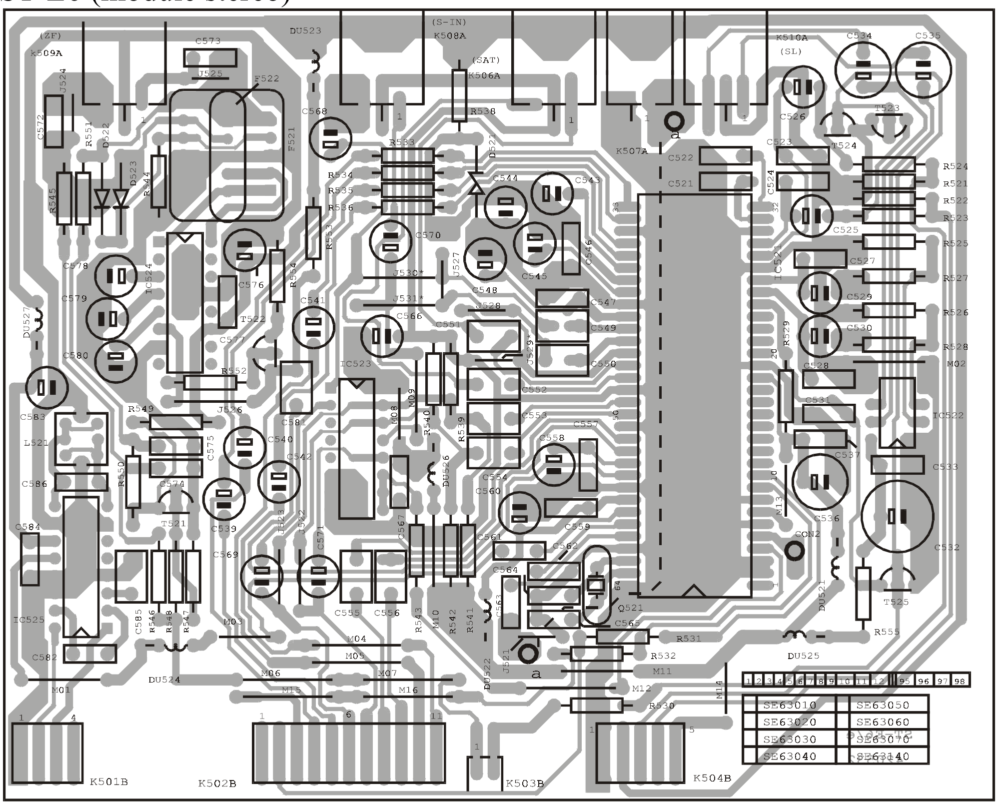
## LZZ-E9



## STD-E6 (module Dolby surround)




## ST-E6 (module stereo)



# LIST OF RECOMMENDED SPARE PARTS FOR CHASSIS AND MODULES

| INDEX | CODE | VALUE<br>MAIN CHASSIS | POSITION |
|---|---|---|---|
| 110 | 412499 | C/EL 220U M400V | C-9642 |
| 90 | 414653 | C/EL 100U M400V | - // - |
| | 415949 | C/EL PR 5,0 2U2 M350V | C-9709 5,0 |
| | 338557 | C/EL PR 5,0 10U T250V | C-9606 5,0 |
| | 414794 | C/EL PR 5,0 47U M160V | C-9605 5,0 |
| | 415947 | C/EL TR 5,0 1U0 M250V | C-9714 5,0 |
| | 415032 | C/EL TR 5,0 2U2 M250V | C-9202 5,0 |
| | 412517 | C/K/KO/Z/2E4 * 2N2M250VAC | C-9645 |
| W, 90 | 414655 | C/MPP PR * U47 J 250V | C-9707 |
| 110, W28<< | 413778 | C/MPP PR * U33 J 250V | - // - |
| W-PH | 415881 | C/MPP PR * U39 J 250V | - // - |
| 110-PH | 429359 | MODULE CAP-E9 PH1 | - // - |
| 110-34« | 433921 | MODULE CAP-E9 34 | - // - |
| | 413782 | C/MPP PR * U68 M 250V | C-9715 |
| W-32« | 425838 | C/PP PR * U015 J 1,6KV | C-9711 22,5 |
| 110-34« | 433920 | MODULE CAP-E9 34 | - // - |
| 90-EK | 316792 | C/PP PR* 7800P J 1,6KV | - // - |
| 110 | 338584 | C/PP PR* U011 J 1,6KV | - // - |
| 90-VC | 412924 | C/PP PR* 6800P J 1,6KV | - // - |
| 90-PH | 413777 | C/PP PR* 8200P J 1,6KV | - // - |
| 90-PH | 415688 | C/PP PR* 8500P J 1,6KV | - // - |
| W-28« | 425986 | C/PP PR* U012 J 1,6KV | - // - |
| | 415936 | C/PP PR* U033 K 630V | C-9627 |
| W-32« | 428781 | C/PP PR* U015 J 1KV | C-9713 22,5 |
| 110 | 415936 | C/PP PR* U033 K 630V | - // - |
| W-28« | 425986 | C/PP PR* U012 J 1,6KV | - // - |
| | 415937 | C/PP PR15,0 220P J 1,6KV | C-9625 15,0 |
| | 429609 | C/X2 PR* U47 M 275VAC | C-9641 |
| | 429610 | C/X2 PR15,0 U10 M 275VAC | C-9646 15,0 |
| | 429611 | C/X2 PR22,5 U22 M 275VAC | C-9636 22,5 |
| | 313551 | D/SI/1N4001 TA | D-9701 12,5 |
| | 313551 | D/SI/1N4001 TA | D-9702 12,5 |
| | 300874 | D/SI/1N4003 TA | D-9205 12,5 |
| | 51666 | D/SI/1N4148 TA | D-9104 10,0 |
| | 51666 | D/SI/1N4148 TA | D-9105 10,0 |
| | 51666 | D/SI/1N4148 TA | D-9106 10,0 |
| | 51666 | D/SI/1N4148 TA | D-9109 12,5 |
| | 51666 | D/SI/1N4148 TA | D-9601 12,5 |
| | 51666 | D/SI/1N4148 TA | D-9606 12,5 |
| | 51666 | D/SI/1N4148 TA | D-9705 12,5 |
| | 51666 | D/SI/1N4148 TA | D-9710 12,5 |
| | 51666 | D/SI/1N4148 TA | D-9902 10,0 |
| | 51666 | D/SI/1N4148 TA | D-9904 10,0 |
| | 51666 | D/SI/1N4148 TA | D-9906 10,0 |
| | 51666 | D/SI/1N4148 TA | D-9911 12,5 |
| | 51666 | D/SI/1N4148 TA | D-9912 12,5 |
| | 412464 | D/SI/BAT85 TA | D-9108 17,5 |

| INDEX | CODE | VALUE<br>MAIN CHASSIS | POSITION |
|---|---|---|---|
| | 324669 | D/SI/BY228 TA | D-9706 20,0/H10 |
| | 410680 | D/SI/BY399 TA | D-9708 20,0/H10 |
| | 410680 | D/SI/BY399 TA | D-9605 15,0/H10 |
| | 410680 | D/SI/BY399 TA | D-9605 15,0/H10 |
| | 410680 | D/SI/BY399 TA | D-9607 15,0/H10 |
| | 410680 | D/SI/BY399 TA | D-9609 15,0/H10 |
| | 410680 | D/SI/BY399 TA | D-9614 15,0/H10 |
| | 424580 | D/SI/BYT52G | D-9302 12,5 |
| | 424580 | D/SI/BYT52G | D-9604 12,5 |
| | 424580 | D/SI/BYT52G | D-9703 12,5 |
| | 424580 | D/SI/BYT52G | D-9704 12,5 |
| | 424580 | D/SI/BYT52G | D-9709 12,5 |
| | 424279 | D/SI/BYT52M TA | D-9608 12,5 |
| | 415931 | D/SI/BYW54 TA | D-9610 12,5 |
| | 415931 | D/SI/BYW54 TA | D-9611 12,5 |
| | 415931 | D/SI/BYW54 TA | D-9612 12,5 |
| | 415931 | D/SI/BYW54 TA | D-9613 12,5 |
| | 417320 | D/SI/BYW76 TA | D-9602 15,0/H10 |
| | 417320 | D/SI/BYW76 TA | D-9707 15,0/H5 |
| | 68571 | DIODE Z/ 2,7V/C/0,5W | D-9711 10,0 |
| | 325626 | DIODE Z/ 3,9V/C/0,5W TA | D-9910 10,0 |
| | 304326 | DIODE Z/33 V/C/0,5W TA | D-9603 12,5 |
| 110 | 416865 | MAINS CHOKE 2X70 MH | DU-9602 |
| 90 | 416961 | MAINS CHOKE 2X33 MH | - // - |
| | 429960 | IC AT24C08-10 PC | IC-9902 |
| | 415922 | IC LM317T | IC-9602 |
| | 415922 | IC LM317T | IC-9604 |
| | 322956 | IC MC7805CT | IC-9605 |
| | 415923 | IC MC7808T | IC-9603 |
| | 430695 | IC SDA545XOTP-B 13 | IC-9901 |
| | 415921 | IC TDA4605-2 | IC-9601 |
| | 419821 | IC TDA7057AQ | IC-9102 |
| 110 | 425757 | IC TDA8351 | IC-9301 |
| 90 | 425758 | IC TDA8356/N5 | - // - |
| 110-P | 427444 | IC TDA8843/N2C | IC-9101 |
| 90-P | 427442 | IC TDA8840/N2C | - // - |
| 90-PS | 427443 | IC TDA8842/N2C | - // - |
| 110-PS | 427445 | IC TDA8844/N2C | - // - |
| | 366430 | IC VIDEO SWITCH | IC-9104 |
| | 423189 | TUNER FDL2473/84A | TUN-9102 |
| EURO | 431379 | TUNER EL2787-84 | |
| | 426141 | CONNECTOR M / 7/2,5 90647-1007 | K-9102A |
| | 426141 | CONNECTOR M / 7/2,5 90647-1007 | K-9901A |
| | 423429 | CONNECTOR M/ / 2/2,5 MKS1951 | K-9103A |
| | 423427 | CONNECTOR M/ / 4/2,5 MKS1954 | K-9701 |
| | 424019 | CONNECTOR M/ 3/2,5 90647-1003 | K-9001A |
| | 424019 | CONNECTOR M/ 3/2,5 90647-1003 | K-9301A |
| | 423988 | CONNECTOR M/4/2,5 90647-1004 | K-9702A |
| | 423989 | CONNECTOR M/ 5/2,5 90647-1005 | K-9104A |

| INDEX | CODE | VALUE<br>MAIN CHASSIS | POSITION |
|---|---|---|---|
| | 319045 | CRYSTAL 4,4 MHz | Q-9101 |
| | 431081 | CRYSTAL 6 MHz | Q-9901 |
| | 316831 | FUSE HOLDER | FOR VA-9601 |
| | 316831 | FUSE HOLDER | FOR VA-9602 |
| | 316831 | FUSE HOLDER | FOR VA-9603 |
| | 421055 | METAL SHIELD E6/E7 | MP-9101 |
| | 79039 | PASTE SILICON P12 | FOR HEATSINK 318695 |
| | 420919 | WASHER CRT B10-301[ST] 0330770023 | PD-9201 |
| | 410208 | MICA WASHER | FOR IC-9602 |
| | 410208 | MICA WASHER | FOR IC-9604 |
| | 338708 | MICA WASHER | FOR T-9602 |
| | 410208 | MICA WASHER | FOR T-9705 |
| | 68503 | IC SOCKET 8 | FOR IC-9902 |
| | 68503 | IC SOCKET 8 | FOR IC-9903 |
| | 419741 | R/NTC B57234-S709-M | R-9629 |
| | 338569 | R/PL TA R47 J 0,5 W | R-9703 15,0 |
| | 415965 | R/PL TA 5K1 J 0,33 W | R-9610 10,0 |
| | 68152 | R/PL TA 100K J 0,25 W | R-9615 IN SER. W. R120K |
| | 52777 | R/PL TA 120K J 0,25 W | R-9615 IN SER. W. R100K |
| | 372123 | R/PL/VR TA 2R2 J 0,33W | R-9121 15,0/H10 |
| | 372123 | R/PL/VR TA 2R2 J 0,33W | R-9156 15,0/H10 |
| | 372123 | R/PL/VR TA 2R2 J 0,33W | R-9715 15,0/H10 |
| | 372123 | R/PL/VR TA 2R2 J 0,33W | R-9953 12,5 |
| | 372123 | R/PL/VR TA 2R2 J 0,33W | R-9977 12,5 |
| | 421131 | R/PL/VR TA 47R J 0,33W | R-9304 15,0/H10 |
| | 421131 | R/PL/VR TA 47R J 0,33W | R-9609 15,0/H10 |
| | 411567 | R/PL/VR TA 120R J 0,75W | R-9210 20,0/H10 |
| | 415009 | R/PL/VR/NG TA 1K0 J 0,5 W | R-9707 15,0/H10 |
| | 411572 | R/PL/VR/VT TA R15 K 0,75W | R-9622 15,0/H10 |
| | 411574 | R/PL/VR/VT TA R22 K 0,4 W | R-9710 15,0/H15 |
| | 411574 | R/PL/VR/VT TA R22 K 0,4 W | R-9713 15,0/H15 |
| | 419823 | R/PLK 0204 TA 2K05 F 0,25 W | R-9618 12,5 |
| | 330380 | R/PLK 0204 TA 3K F 0,25 W | R-9118 10,0 |
| | 330380 | R/PLK 0204 TA 3K F 0,25 W | R-9308 12,5 |
| | 313601 | R/PLK 0204 TA 10K F 0,25 W | R-9909 10,0 |
| | 429553 | R/PLK 0204 TA 39K F 0,25 W | R-9122 12,5 |
| | 419824 | R/PLK 0204 TA 243R F 0,25 W | R-9616 12,5 |
| | 419824 | R/PLK 0204 TA 243R F 0,25 W | R-9623 12,5 |
| | 419825 | R/PLK 0204 TA 715R F 0,25 W | R-9625 12,5 |
| | 416940 | R/PLK/VN TA 220K J 1 kV | R-9701 12,5 |
| | 433776 | R/PLK/VN TA 820K J 1,6KV | R-9613 12,5 |
| | 316701 | R/PLKO TA R82 J 1W | R-9702 15,0 |
| | 420920 | R/PLKO TA 1R0 J 1W | R-9207 15,0/H10 |
| | 420920 | R/PLKO TA 1R0 J 1W | R-9306 20,0/H10 |
| | 429521 | R/PLKO TA 2R7 J 4W | R-9714 20,0/H15 |
| | 419822 | R/PLKO TA 10R J 2W | R-9725 20,0/H20 |
| | 416508 | R/PLKO TA 22K J 2W | R-9603 20,0/H15 |
| | 415953 | R/PLKO TA 27K K 6W | R-9624 35,0/H20 |
| | 415952 | R/PLKO TA 47K J 1,5W | R-9606 20,0/H10 |

| INDEX | CODE | VALUE<br>MAIN CHASSIS | POSITION |
|---|---|---|---|
| | 429522 | R/PLKO TA 75K J 4 W | R-9604 20,0/H15 |
| | 417319 | R/PLKO TA 120R K4 W | R-9305 20,0/1-110 |
| | 430531 | R/PTC 16:9 T209 | R-9628 |
| | 338709 | CLIP IC | FOR IC-9102 |
| | 338709 | CLIP IC | FOR IC-9301 |
| | 338709 | CLIP IC | FOR IC-9602 |
| | 338709 | CLIP IC | FOR IC-9604 |
| | 338709 | CLIP IC | FOR T-9602 |
| | 338709 | CLIP IC | FOR T-9701 |
| | 422699 | CLIP IC | FOR T-9705 |
| | 423137 | T/FET/BUZ90A | T-9602 |
| | 338580 | T/NPN/AF/BC639 TR | T-9703 |
| | 411262 | T/NPN/BC547B TR | T-9104 |
| | 411262 | T/NPN/BC547B TR | T-9105 |
| | 411262 | T/NPN/BC547B TR | T-9106 |
| | 411262 | T/NPN/BC547B TR | T-9108 |
| | 411262 | T/NPN/BC547B TR | T-9601 |
| | 411262 | T/NPN/BC547B TR | T-9603 |
| | 411262 | T/NPN/BC547B TR | T-9702 |
| | 411262 | T/NPN/BC547B TR | T-9706 |
| | 411262 | T/NPN/BC547B TR | T-9902 |
| | 411262 | T/NPN/BC547B TR | T-9904 |
| | 411262 | T/NPN/BC547B TR | T-9905 |
| | 411262 | T/NPN/BC547B TR | T-9906 |
| | 411262 | T/NPN/BC547B TR | T-9908 |
| 110, W | 415900 | T/NPN/BU508AF | T-9701 |
| 90 | 413787 | T/NPN/BU508D/BU508DF/BU508DR | - // - |
| | 415928 | T/NPN/PH2369 TR | T-9109 |
| | 415928 | T/NPN/PH2369 TR | T-9903 |
| | 411261 | T/PNP/BC212B/BC557B TR | T-9107 |
| | 411261 | T/PNP/BC212B/BC557B TR | T-9110 |
| | 411261 | T/PNP/BC212B/BC557B TR | T-9704 |
| | 411261 | T/PNP/BC212B/BC557B TR | T-9911 |
| | 414036 | T/PNP/BD242 | T-9705 |
| D, SW | 420389 | TRANSFORM. SMPS E6 | TR-9601 |
| ST | 425763 | TRANSFORM. SMPS E9 110 | - // - |
| 90 | 425764 | TRANSFORM. SMPS E9 90 | - // - |
| W | 427975 | TRANSFORM.HV E9 16:9 | TR-9701 |
| 110 | 425765 | TRANSFORM.HV E9 | - // - |
| 90 | 425766 | TRANSFORM.HV E9 90 | - // - |
| | 378773 | TRANSFORM. DRIVER G2/E5 | TR-9702 |
| 110 | 339150 | LINEARITY COIL 12-25 | L-9701 |
| 90 | 413801 | LINEARITY COIL G4/E5 | - // - |
| W-32« | 429470 | LINEARITY COIL EKM 12-126 | - // - |
| W-28« | 429703 | LINEARITY COIL EKM 12-127 | - // - |
| 110-34« | 433863 | LINEARITY COIL EKM 12-134 | - // - |
| | 427974 | COIL EW E9 | L-9703 |
| | 21108 | FUSE T 1,25 A L 250V | VA-9601 |
| | 21108 | FUSE T 1,25 A L 250V | VA-9602 |

| INDEX | CODE | VALUE | POSITION |
|---|---|---|---|
| | | MAIN CHASSIS | |
| | 431998 | FUSE T2A E 250V | VA-9603 |
| | | MODULES | |
| | 427639 | MODULE KD-E6/9 | K-1201 - K-1203 |
| | 428383 | MODULE SVHS-E9 | K-401 - K402 |
| D | 429975 | MODULE APD-E9 | K-001 |
| D | 430836 | MODULE STD-E6/9 II | K-500 - K-504 |
| ST | | MODULE ST E-6/9 | - // - |
| | | MODULE ST E-9 | - // - |
| | 433983 | MODULE PIP2 E9/1 S2 | K-800 - K-805 |
| | 431365 | MODULE LZZ-E9/1 | K-703, K-704 |
| | | MODULE KD | |
| | 52819 | FILTER CER.SFE 5,5 MHz 5,5MC | Q-1204 |
| | 413802 | FILTER CER.TRAP TPS 5,5 MB | Q-1202 |
| | 419135 | FILTER OFW G 1968 | F-1201 |
| | 423180 | IC TDA9800 | IC-1201 |
| | 416507 | TUNER FL 2477/84 | TUN-1201 |
| | 420732 | CONNECTOR Z/32/ 3/2,54 | K-1202B |
| | 420735 | CONNECTOR Z/32/ 4/2,54 | K-1201 B |
| | 423179 | REFEREN. COIL 77,8MHZ | L-1201 |
| | 413792 | CONTACT HEADER / 2/2,5 | K-1203B |
| | 51900 | P/PL/NA/LIN/V 25K 0,05W | P-1201 |
| | 411262 | T/NPN/BC547B TR | T-1201 |
| | 411262 | T/NPN/BC547B TR | T-1203 |
| | 411261 | T/PNP/BC212B/BC557B TR | T-1202 |
| | | MODULE SVHS | |
| | 419731 | IC TDA8540 | IC-401 |
| | 427631 | CONNECTOR Z/32/13/2,54 | K-401 B |
| | 420734 | CONNECTOR Z/32/ 5/2,54 | K-402B |
| | 423419 | CONNECTOR M/ / 3/2,5 MKS2953 | K-404B |
| | | STERO MODULE | |
| | 419734 | DIODE Z/ 8,2V/C/0,5W TA | D-521 12,5 |
| D | 425590 | IC DPL3519A | IC-523 |
| D | 420187 | IC MSP3400 | IC-521 |
| N | 425622 | IC MSP3410D | - // - |
| | 433927 | IC MSP3401G | - // - |
| | 378782 | IC TDA2545A | IC-523 |
| | 422733 | IC TDA4445B | IC-524 |
| | 419728 | IC TDA7050 | IC-522 |
| | 338638 | CONNECTOR Z/ /3/2,5 | K-506B |
| | 420735 | CONNECTOR Z/32/ 4/2,54 | K-501 B |
| | 420734 | CONNECTOR Z/32/ 5/2,54 | K-504B |
| | 420736 | CONNECTOR Z/32/11/2,54 | K-502B |
| | 423419 | CONNECTOR M/ / 3/2,5 MKS2953 | K-506A |
| | 423419 | CONNECTOR M/ / 3/2,5 MKS2953 | K-508A |
| | 423417 | CONNECTOR M/ / 7/2,5 MKS2957 | K-507A |
| | 423991 | CONNECTOR M/ 3/2,5 90649-1003 | K-51 OA |
| | 420188 | CRYSTAL 18,432MHZ 4730006848 | Q-521 |
| | 424135 | REFEREN. COIL 38,9MHZ KZS-73 | L-521 |

| INDEX | CODE | VALUE | POSITION |
|---|---|---|---|
| | 413792 | CONTACT HEADER 2/2,5 | K-503B |
| | 414955 | R/PL/VR/VT TA 10R K 0,4 W | R-555 12,5 |
| | 411262 | T/NPN/BC547B TR | T-523 |
| | 411262 | T/NPN/BC547B TR | T-524 |
| | 411262 | T/NPN/BC547B TR | T-525 |
| | | MODULE OC | |
| | 419754 | DIODE Z/130 V/C/2W TA | D-661 12,5 |
| | 419736 | IC SFH617 | IC-661 |
| | 330418 | P/PL/NA/LIN/H 1K 0,05W | P-661 |
| | 338577 | R/PLK/VN TA 10M K 10 kV | R-665 22,5 |
| | 411262 | T/NPN/BC547B TR | T-661 |
| | | MODULE AP | |
| | 424406 | IC TDA2616Q | IC-91302 |
| | 423425 | CONNECTOR M/ / 7/2,5 MKS1957 | K-91301 |
| | 424019 | CONNECTOR M/ 3/2,5 90647-1003 | K-91303 |
| | 338709 | CLIP IC | FOR IC-91302 |
| | 411262 | T/NPN/BC547B TR | T-91301 |
| | | MODULE LZZ | |
| | 415949 | C/EL PR 5,0 2U2 M350V | C-9752 5,0 |
| | 427971 | C/MPP PR22,5 1U0 J 400V | C-9751 22,5 |
| | 414037 | C/PP PR * 2200P J 1,6KV | C-9753 |
| | 51666 | D/SI/1N4148 TA | D-9752 12,5 |
| | 51666 | D/SI/1N4148 TA | D-9753 12,5 |
| | 51666 | D/SI/1N4148 TA | D-9754 12,5 |
| | 424580 | D/SI/BYT52G | D-9751 15,0/H10 |
| | 415923 | IC MC7808T | IC-9751 |
| | 423987 | CONNECTOR M/ 2/2,5 90647-1002 | K-9751 |
| | 415009 | R/PL/VR/NG TA 1 KO J 0,5 W | R-9751 15,0/H10 |
| | 419485 | T/NPN/337 | T-9751 |
| | 419485 | T/NPN/337 | T-9753 |
| | 314862 | T/PNP/BC327 | T-9752 |
| | 431359 | BRIDGE COIL E9/2 | L-9751 |
| | | MODULE PIP | |
| | 412710 | C/ELB TR 5,0 10U M 40V | C-9834 5,0 |
| | 412710 | C/ELB TR 5,0 10U M 40V | C-9845 5,0 |
| | 412710 | C/ELB TR 5,0 10U M 40V | C-9846 5,0 |
| | 51666 | D/SI/1N4148 TA | D-9800 12,5 |
| | 51666 | D/SI/1N4148 TA | D-9802 12,5 |
| | 412464 | D/SI/BAT85 TA | D-9801 12,5 |
| | 420773 | IC SDA9288 | IC-9802 |
| | 425756 | IC TDA8310A | IC-9801 |
| | 366430 | IC VIDEO SWITCH | IC-9803 |
| | 427630 | CONNECTOR Z/32/ 2/2,54 | K-9803A |
| | 420732 | CONNECTOR Z/32/ 3/2,54 | K-9801 B |
| | 420734 | CONNECTOR Z/32/ 5/2,54 | K-9802B |
| | 420734 | CONNECTOR Z/32/ 5/2,54 | K-9805B |
| | 427631 | CONNECTOR Z/32/13/2,54 | K-9804B |
| | 423418 | CONNECTOR M/ / 4/2,5 MKS2954 | K-9806B |
| | 319045 | CRYSTAL 4,4 MHz | Q-9801 |
| | 420070 | CRYSTAL 20,48MHZ | Q-9802 |

| INDEX | CODE | VALUE | POSITION |
|---|---|---|---|
| | 413792 | CONTACT HEADER / 2/2,5 | K-9800B |
| | 426647 | CONTACT HEADER 36/ 2/2,54 | K-9803A |
| | 420581 | CONTACT HEADER 36/ 3/2,54 | K-9801A |
| | 420580 | CONTACT HEADER 36/ 5/2,54 | K-9802A |
| | 420580 | CONTACT HEADER 36/ 5/2,54 | K-9805A |
| | 426571 | CONTACT HEADER 36/13/2,54 | K-9804A |
| | 372123 | R/PL/VR TA 2R2 J 0,33W | R-9817 10,0/H10 |
| | 372123 | R/PL/VR TA 2R2 J 0,33W | R-9826 12,5 |
| | 415206 | T/NPN/SMD BC847B T | T-9801 |
| | 415206 | T/NPN/SMD BC847B T | T-9807 |
| | 415206 | T/NPN/SMD BC847B T | T-9808 |
| | 415206 | T/NPN/SMD BC847B T | T-9810 |
| | 415206 | T/NPN/SMD BC847B T | T-9811 |
| | 415206 | T/NPN/SMD BC847B T | T-9812 |
| | 427809 | T/NPN/SMD PMBT2369 | T-9804 |
| | 411261 | T/PNP/BC212B/BC557B TR | T-9809 |
| | 414025 | T/PNP/SMD BC857 T | T-9806 |

LEGEND:
110............110 picture tube  90..............90 picture tube
W..............16:9 picture tube  W-28«.........28<<, 16:9 picture tube
PH............. PHILIPS  EK.............. EKRANAS
D............... DOLBY  S............... STEREO
SW............ SUBWOOFER

NOTES: